PUB.DIM-767

Canon

HDV Camcorder
Instruction Manual
English

Caméscope HDV
Manuel d'instruction
Français

Cámara HDV
Manual de Instrucciones
Español

HV10



Mini DV Digital Video Cassette

HDV 1080i

PictBridge

Please read also the following instruction manual (electronic version on PDF file). For further details refer to the installation guide.
Veuillez lire aussi le manuel d'instruction suivant (version électronique sur fichier PDF). Pour d'autres détails référez-vous au guide d'installation.
Lea también el siguiente manual de instrucciones (versión electrónica en archivo PDF). Para mayores detalles, refiérase a la guía de instalación.



- **Digital Video Software**

NTSC

Important Usage Instructions

WARNING!



TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

WARNING!



TO REDUCE THE RISK OF ELECTRIC SHOCK AND TO REDUCE ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

COPYRIGHT WARNING:
Unauthorized recording of copyrighted materials may infringe on the rights of copyright owners and be contrary to copyright laws.

HDV Camcorder, HV10 A systems

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and use in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Use of shielded cable is required to comply with class B limits in Subpart B of Part 15 of FCC Rules.
Do not make any changes or modifications to the equipment unless otherwise specified in the manual.
If such changes or modifications should be made, you could be required to stop operation of the equipment.

Canon U.S.A. Inc.
One Canon Plaza, Lake Success, NY 11042, U.S.A.
Tel No. (516)328-5600

CAUTION:
TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

Important Warning









The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

IMPORTANT SAFETY INSTRUCTIONS

In these safety instructions the word “product” refers to the Canon HDV Camcorder HV10 A and all its accessories.

1 Read Instructions — All the safety and operating instructions should be read before the product is operated.

2 Retain Instructions — The safety and operating instructions should be retained for future reference.

3 Heed Warnings — All warnings on the product and in the operating instructions should be adhered to.

4 Follow Instructions — All operating and maintenance instructions should be followed.

5 Cleaning — Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. The product should be cleaned only as recommended in this manual.

6 Accessories — Do not use accessories not recommended in this manual as they may be hazardous.

7 Avoid magnetic or electric fields — Do not use the camera close to TV transmitters, portable communication devices or other sources of electric or magnetic radiation. They may cause picture interference, or permanently damage the camera.

8 Water and Moisture — Hazard of electric shock — Do not use this product near water or in rainy/moist situations.

9 Placing or Moving — Do not place on an unstable cart, stand, tripod, bracket or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product.
A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



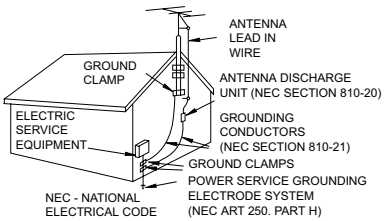
10 Power Sources — The CA-570 Compact Power Adapter should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. Regarding other power sources such as battery power, refer to instructions in this manual.

11 Polarization — The CA-570 Compact Power Adapter is equipped with a polarized 2-prong plug (a plug having one blade wider than the other).
The 2-prong polarized plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

12 Power Cord Protection — Power cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to plugs and the point from which the cords exit the product.

13 Outdoor Antenna Grounding — If an outside antenna is connected to the product, be sure the antenna is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI / NFPA No. 70—1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See figure 1.

Fig. 1 EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE



14 Lightning — For added protection of this product during a lightning storm, or when it is left unattended and unused for long periods of time, disconnect it from the wall outlet and disconnect the antenna. This will prevent damage to the product due to lightning and power-line surges.

15 Overloading — Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

16 Objects and Liquid Entry — Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Be careful not to spill liquid of any kind onto the product.

17 Servicing — Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18 Damage Requiring Service — Disconnect this product from the wall outlet and all power sources including battery, and refer servicing to qualified service personnel under the following conditions:

a. When the power-supply cord or plug is damaged.
b. If any liquid has been spilled onto, or objects have fallen into, the product.
c. If the product has been exposed to rain or water.
d. If the product does not operate normally even if you follow the operating instructions. Adjust only those controls that are covered by the operation instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e. If the product has been dropped or the cabinet has been damaged.
f. When the product exhibits a distinct change in performance. This indicates a need for service.

19 Replacement Parts — When replacement parts are required, be sure the service technician has used replacement parts that are specified by Canon or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

20 Safety Check — Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating order.

When replacement of the power supply is required, please return it to the responsible nearest Canon Service Center and please replace it with the same type number CA-570.

The Adapter can be used with a power supply between 100 and 240 V AC. For areas where 120 V AC power is not used, you will need a special plug adapter. Contact your nearest Canon Service Center for further information.

This Class B digital apparatus complies with Canadian ICES-003.

Enjoying High-Definition Video

Preserve your most treasured memories, be it unforgettable scenic beauty or cherished moments spent with family and friends, with high definition video recordings of a quality second only to actually being there.

What is High-Definition Video?

High-definition video (HDV) allows you to record video of unparalleled high quality on regular miniDV tapes. HDV is composed of 1,080 horizontal lines –that is more than twice the number of horizontal lines and approximately 4 times the number of pixels in standard definition TV broadcasts– resulting in incredibly beautiful and richly detailed video recordings.



1,080 lines

How to play back your HDV recordings?

- On a high-definition TV (HDTV) (📖 57)

HDV recordings will be played back in their original high quality.

- On standard definition TVs (📖 58)

HDV recordings will be down-converted to match the resolution of the TV set.



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Additional Information

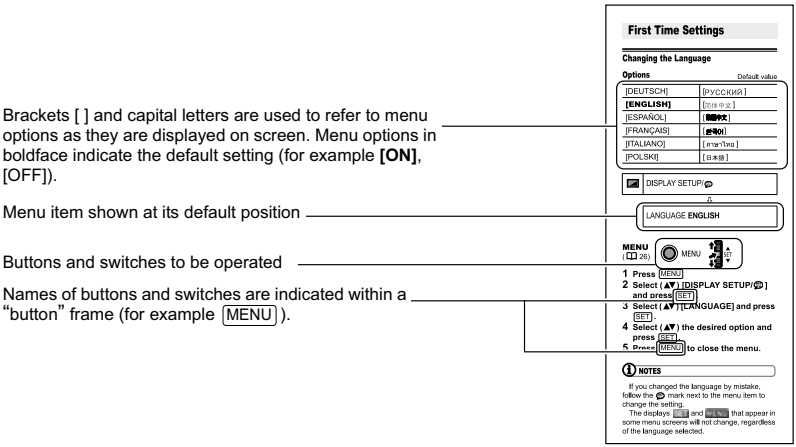
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About this Manual

Thank you for purchasing the Canon HV10. Please read this manual carefully before you use the camcorder and retain it for future reference. Should your camcorder fail to operate correctly, refer to the *Troubleshooting* table (📖 73).

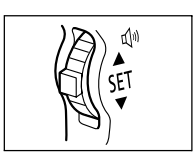
Conventions Used in the Manual

- IMPORTANT: Precautions related to the camcorder operation.
- NOTES: Additional topics that complement the basic operating procedures.
- POINTS TO CHECK: Restrictions that apply if the function described is not available in all operating modes (the operating mode to which the camcorder should be set, etc.).
- 📖 : Reference page number.
- "Screen" refers to the LCD and the viewfinder screen.
- The photos included in the manual are simulated pictures taken with a still camera.



About the SET dial

Turn the SET dial up and down (▲▼) to select options in a menu, change setting, etc. Press the SET dial itself (SET) to make a selection or change a setting.



About the Operating Modes

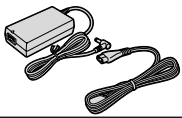
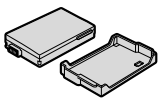
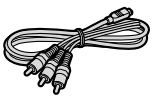
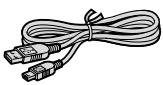
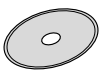
The camcorder's operating mode is determined by the positions of the power switch and the / switch. In the manual, CAMERA indicates that a function is available in the operating mode shown and CAMERA indicates that the function is not available. When no operating mode icons are given, the function is available in all operating modes.

Operating Mode	POWER Switch	/ Switch	Icon Display	Operation	
CAMERA	CAMERA	(Tape)		Recording movies on the tape	25
PLAY	PLAY			Playing movies from the tape	27
CAMERA	CAMERA	(Memory card)		Recording still images on the memory card	26
PLAY	PLAY			Viewing still images from the memory card	29

Trademark Acknowledgements

- miniSD™ is a trademark of SD Card Association.
- Windows® is a registered trademark of Microsoft Corporation in the United States and/or other countries.
- Macintosh and Mac OS are trademarks of Apple Computer, Inc., registered in the United States and other countries.
- Mini DV is a trademark.
- HDV and the HDV logo are trademarks of Sony Corporation and Victor Company of Japan, Ltd. (JVC).
- Other names and products not mentioned above may be trademarks or registered trademarks of their respective companies.
- ANY USE OF THIS PRODUCT OTHER THAN CONSUMER PERSONAL USE IN ANY MANNER THAT COMPLIES WITH THE MPEG-2 STANDARD FOR ENCODING VIDEO INFORMATION FOR PACKAGED MEDIA IS EXPRESSLY PROHIBITED WITHOUT A LICENSE UNDER APPLICABLE PATENTS IN THE MPEG-2 PATENT PORTFOLIO, WHICH LICENSE IS AVAILABLE FROM MPEG LA, L.L.C., 250 STEELE STREET, SUITE 300, DENVER, COLORADO 80206.

Supplied Accessories

CA-570 Compact Power Adapter (incl. power cord) 	BP-310 Battery Pack 	WL-D87 Wireless Controller 	Lithium Button Battery CR2025 for Wireless Controller 
CTC-100 Component Cable 	STV-250N Stereo Video Cable 	IFC-300PCU USB Cable 	DIGITAL VIDEO SOLUTION DISK Software CD-ROM* 

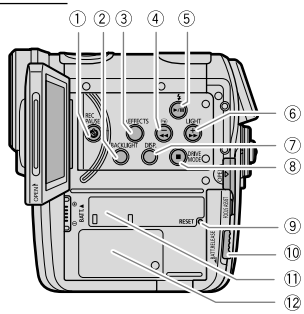
* Includes the electronic version of the *Digital Video Software* instruction manual on PDF file.

The serial number of this product can be found at the battery attachment unit of the camcorder. Write down the number and other information here and retain this book as a permanent record of your purchase to aid identification in case of theft.

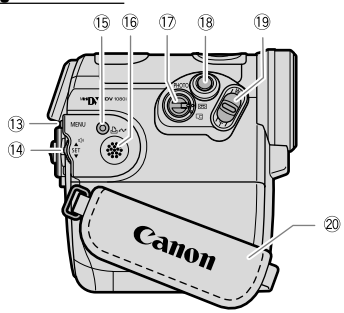
Date of Purchase: Model Name: HV10 A
Purchased From: Serial No.:
Dealer Address:
Dealer Phone No.:

Components Guide

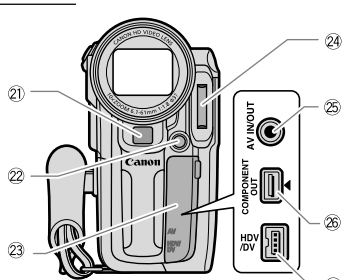
Left side view



Right Side View



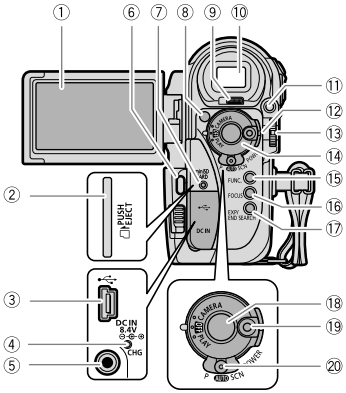
Front view



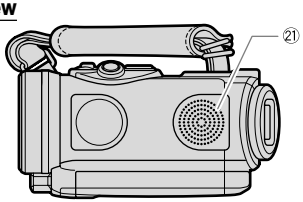
① REC PAUSE button (📖 61, 62)/
Self timer button (📖 52)
② BACKLIGHT button (📖 22)
③ D.EFFECTS button (📖 53)
④ (record review) button (📖 25)/
◀◀ (rewind) button (📖 27)/
Card – button (📖 29)
⑤ ϟ (flash) button (📖 51)/
▶/❚❚ (play/pause) button (📖 27)
⑥ LIGHT button (📖 52)/
▶▶ (fast forward) button (📖 27)/
Card + button (📖 29)
⑦ DISP. (display) button (📖 50)
⑧ DRIVE MODE button (📖 49)/
■ (stop) button (📖 27)
⑨ RESET button (📖 73)
⑩ BATT. RELEASE switch (📖 19)
⑪ Serial number
⑫ Battery attachment unit (📖 18)
⑬ MENU button (📖 22, 31)
⑭ SET dial (📖 9)
⑮ (print/share) button (📖 66, 68)
⑯ Speaker
⑰ / (tape/card) switch (📖 10)
⑱ PHOTO button (📖 26)
⑲ Zoom lever (📖 26)
⑳ Grip belt (📖 20)
㉑ Instant AF sensor (📖 31)
㉒ Mini video light (📖 52)
㉓ Terminal cover
㉔ Flash (📖 51)
㉕ AV IN/OUT terminal (📖 57)
㉖ COMPONENT OUT terminal (📖 57)
㉗ HDV/DV terminal (📖 57, 64)

Names of buttons and switches are indicated within a "button" frame (for example [MENU]).

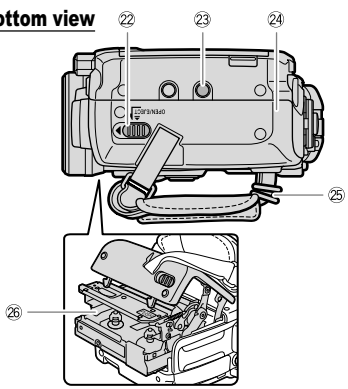
Back view



Top view



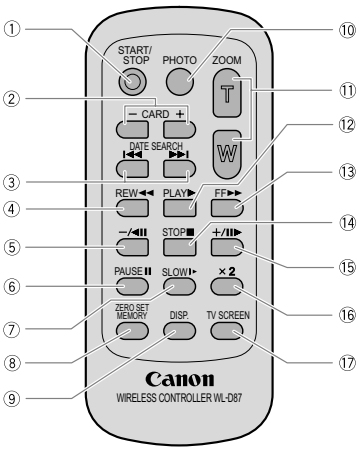
Bottom view



①	LCD screen (📖 21)
②	Memory card slot (📖 20)
③	USB terminal (📖 64)
④	CHG (charge) indicator (📖 18)
⑤	DC IN terminal (📖 18)
⑥	FOCUS ASSIST button (📖 45)
⑦	CARD access indicator (📖 26)
⑧	Remote sensor (📖 21)
⑨	Dioptric adjustment lever (📖 20)
⑩	Viewfinder (📖 20)
⑪	MENU button (📖 22, 31)
⑫	Power indicator (📖 10)
⑬	SET dial (📖 9)
⑭	POWER switch (📖 10)
⑮	FUNC. button (📖 23, 37)
⑯	FOCUS button (📖 44)
⑰	EXP (exposure) button (📖 43)/ END SEARCH button (📖 28)
⑱	Start/stop button (📖 25)
⑲	Lock button
⑳	Mode switch (📖 40)
㉑	Stereo microphone
㉒	OPEN/EJECT ⏏ switch (📖 19)
㉓	Tripod socket (📖 26)
㉔	Cassette compartment cover (📖 19)
㉕	Strap mount
㉖	Cassette compartment (📖 19)

Names of buttons and switches are indicated within a "button" frame (for example [MENU]).

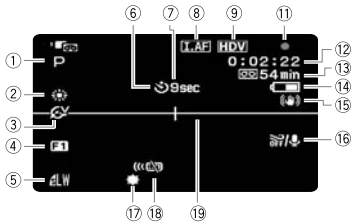
Wireless Controller WL-D87

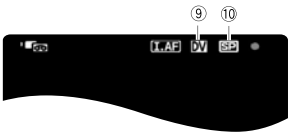


① START/STOP button (📖 25)
② CARD –/+ buttons (📖 29)
③ DATE SEARCH ⏮/⏭ buttons (📖 29)
④ REW ◀◀ button (📖 27)
⑤ –/◀ ❚❚ button (📖 27)
⑥ PAUSE ❚❚ button (📖 27)
⑦ SLOW ❙► button (📖 27)
⑧ ZERO SET MEMORY button (📖 28)
⑨ DISP. (on-screen display) button (📖 50)
⑩ PHOTO button (📖 26)
⑪ Zoom buttons (📖 26)
⑫ PLAY ▶ button (📖 27)
⑬ FF ▶▶ button (📖 27)
⑭ STOP ■ button (📖 27)
⑮ +/❚❚▶ button (📖 27)
⑯ **×2** button (📖 27)
⑰ TV SCREEN button (📖 36)

Screen Displays

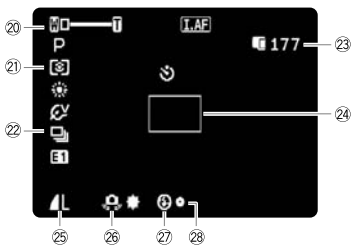
CAMERA·📼 Recording Movies





①	Recording program (📖 40)
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③	Image effect (📖 46)
④	Digital effects (📖 53)
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⑩	DV recording mode (📖 32)
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⑬	Remaining tape
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CAMERA·📷 Recording Still Images



⑳	Zoom (📖 26), Exposure ●—I—● (📖 43)
㉑	Light metering mode (📖 43)
㉒	Drive mode (📖 49)
㉓	Number of still images available on the memory card
㉔	AF frame (📖 44)
㉕	Still image quality/size (📖 47)
㉖	Camcorder shake warning (📖 31)
㉗	Flash (📖 51)
㉘	AF/AE locked during still image recording (📖 26)

⑦ **Recording reminder**

The camcorder counts from 1 to 10 seconds when you start recording. This is helpful to avoid scenes that are too short.

⑩ **Tape operation**

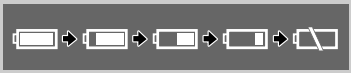
● Record, ●❚❚ Record pause,
■ Stop, ⏏ Eject,
▶▶ Fast forward, ◀◀ Rewind,
▶ Playback, ▶❚❚ Playback pause,
❚❚◀ Reverse playback pause,
x1▶ Playback (normal speed),
◀x1 Reverse playback (normal speed),
x2▶ Playback (double speed),
◀x2 Reverse playback (double speed),
▶▶ Fast forward playback,
◀◀ Rewind playback,
❙▶ Slow playback,
◀❙ Slow reverse playback,
❚❚▶ Frame advance,
◀❚❚ Frame reverse,
❙◀◀/▶▶❙ Date search (🕮 29),
◀◀/▶▶ Zero set memory (🕮 28)

⑫ **Remaining tape**

Indicates the remaining time of the tape in minutes. "📼" moves during recording. When the tape reaches its end, the display changes to "📼 END".

- When the time left is less than 15 seconds, the remaining tape time may not appear.
- Depending on the type of the tape, the indication may not be displayed correctly.

⑬ **Remaining battery charge**



- When "🔋" starts flashing in red replace the battery pack with a fully charged one.
- When you attach an empty battery pack, the power may turn off without displaying "🔋".
- Depending on the conditions under which the camcorder and the battery pack are used, the actual battery charge may not be indicated accurately.

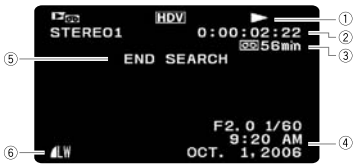
㉒ **Number of still images available on the memory card**

Depending on the recording conditions, the number of still images available displayed may not decrease even after a recording has been made, or may decrease by 2 still images at once.

Card Access Display

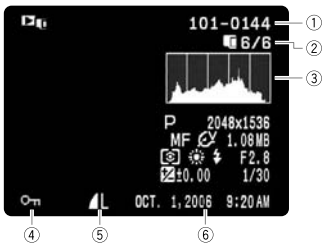
"▶ 🖼" is displayed next to the number of images available while the camcorder is writing on the memory card.

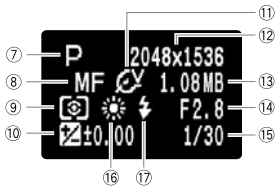
PLAY·📼 Playing Movies



① Tape operation
② Time code (hours : minutes : seconds : frames)
③ Remaining tape
④ Data code (📖 51)
⑤ Search function display END SEARCH (📖 28)/ DATE SEARCH (📖 29)
⑥ Quality/size for capturing still images (📖 49)

PLAY·🖼 Viewing Still Images



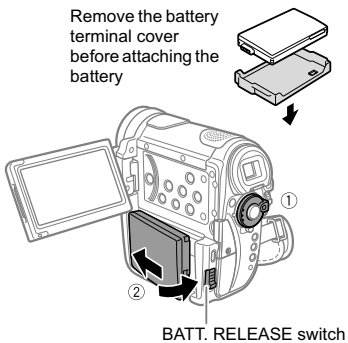


① Image number (📖 33)
② Current image / Total number of images
③ Histogram (📖 51)
④ Image protection mark (📖 55)
⑤ Still image quality/size
⑥ Date and time of recording
⑦ Recording program (📖 40)
⑧ Manual focus (📖 44)
⑨ Light metering mode (📖 43)
⑩ Manual exposure (📖 43)
⑪ Image effect (📖 46)
⑫ Image size (📖 47)
⑬ File size
⑭ Aperture value (📖 41)
⑮ Shutter speed (📖 41)
⑯ White balance (📖 45)
⑰ Flash (📖 51)

Getting Started

Charging the Battery Pack

The camcorder can be powered with a battery pack or directly using the compact power adapter. Charge the battery pack before use.

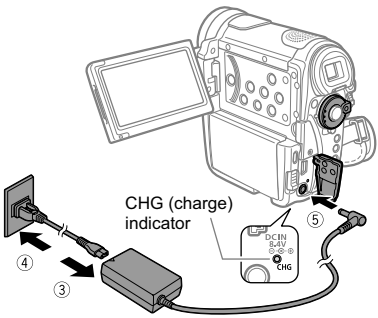


1 Turn off the camcorder.

2 Attach the battery pack to the camcorder.

• Open the LCD panel.

• Slide in the connector end of the battery in the direction of the arrow and press it gently until it clicks.



3 Connect the power cord to the compact power adapter.

4 Plug the power cord into a power outlet.

5 Connect the compact power adapter to the camcorder's DC IN terminal.

• The CHG (charge) indicator starts flashing. The indicator will stay on when the charging is completed.

Charging, Recording and Playback Times

The times given in the table below are approximate and vary depending on the actual charging, recording or playback conditions.

	BP-310 (Supplied)		BP-315 (Optional)	
HDV **Standard**	Maximum	Typical*	Maximum	Typical*
Recording (viewfinder)	75 min.	45 min.	140 min.	85 min.
Recording (LCD normal)	75 min.	45 min.	135 min.	85 min.
Recording (LCD bright)	70 min.	45 min.	130 min.	80 min.
Playback	85 min.		160 min.	
DV **Standard**	Maximum	Typical*	Maximum	Typical*
Recording (viewfinder)	90 min.	55 min.	165 min.	95 min.
Recording (LCD normal)	85 min.	50 min.	160 min.	95 min.
Recording (LCD bright)	80 min.	50 min.	150 min.	90 min.
Playback	95 min.		180 min.	
Charging Time	150 min.		230 min.	

* Approximate times for recording with repeated operations such as start/stop, zooming, power on/off.

• You can also use the compact power adapter without attaching a battery pack.
• When the compact power adapter is connected, even if a battery is attached its power will not be consumed.

ONCE THE BATTERY IS FULLY CHARGED

1 Disconnect the compact power adapter from the camcorder.

2 Unplug the power cord from the power outlet and the compact power adapter.

TO REMOVE THE BATTERY PACK

Slide down BATT.RELEASE to release the battery pack, and pull out the battery pack holding it from the ridge on its bottom part.

IMPORTANT

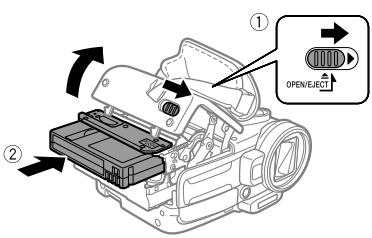
● You may hear some noise from the compact power adapter during use. This is not a malfunction.
● We recommend charging the battery pack in temperatures between 10 °C and 30 °C (50 °F and 86 °F). Outside the temperature range of 0 °C to 40 °C (32 °F to 104 °F), the charging will not start.
● Do not connect to the camcorder's DC IN terminal or to the compact power adapter any electrical equipment that is not expressly recommended for use with this camcorder.
● To prevent equipment breakdowns and excessive heating, do not connect the supplied compact power adapter to voltage converters for overseas travels or special power sources such as those on aircraft and ships, DC-AC inverters, etc.

NOTES

● If you connect a faulty power adapter or battery pack, the CHG (charge) indicator flashes approx. twice per second and the charging stops.
● The CHG (charge) indicator also serves as a rough estimate of the battery charge status.
Continuously on: Battery fully charged.
Flashes approx. twice per second: Battery over 50% charged.
Flashes approx. once per second: Battery less than 50% charged.
● The charging time will vary depending on the surrounding temperature and the battery pack's initial charge condition. In cold places, the effective usage time of the battery will decrease.
● We recommend that you prepare battery packs 2 to 3 times longer than you think you might need.
● **U.S.A. and Canada only:** The lithium ion/polymer battery that powers this product is recyclable. Please call 1-800-8-BATTERY for information on how to recycle this battery.

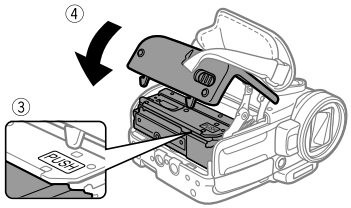
Inserting and Removing a Tape

Use only videocassettes marked with the Mini DV logo. To record in HDV standard we recommend using tapes specifically designed for high definition.



1 Slide OPEN/EJECT fully in the direction of the arrow and open the cassette compartment cover.
The cassette compartment opens automatically.

2 Insert the cassette.
• Insert the cassette with the window facing the grip belt.
• To remove a cassette pull it straight out.



3 Press the PUSH mark on the cassette compartment until it clicks.

4 Wait for the cassette compartment to retract automatically and close the cassette compartment cover.

IMPORTANT

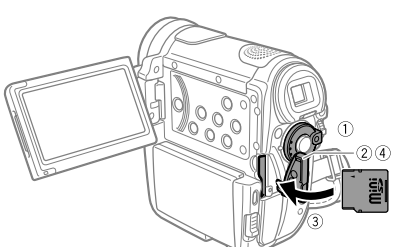
- Do not interfere with the cassette compartment while it is opening or closing automatically, or attempt to close the cover before the cassette compartment has fully retracted.
- Be careful not to get your fingers caught in the cassette compartment cover.

NOTES

If the camcorder is connected to a power source, cassettes can be inserted/removed even if the POWER switch is set to OFF.

Inserting and Removing a Memory Card

Use only commercially available miniSD cards.



1 Turn off the camcorder.

2 Open the memory card slot cover.

3 Insert the memory card straight all the way into the memory card slot.

4 Close the cover.

Do not force the cover closed if the memory card is not correctly inserted.

TO REMOVE THE MEMORY CARD

First push the memory card once to release it, and then pull the card out.

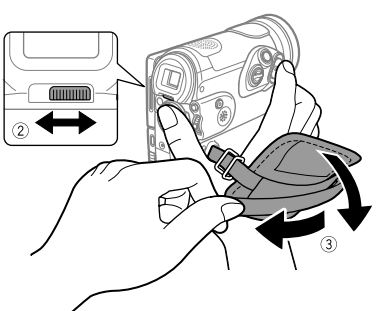
IMPORTANT

- Make sure to initialize all memory cards before using them with this camcorder for the first time (📖 56).
- Memory cards have front and back sides that are not interchangeable. Inserting a memory card facing the wrong direction can cause a malfunction of the camcorder.

NOTES

Performance cannot be guaranteed for all miniSD cards.

Preparing the Camcorder

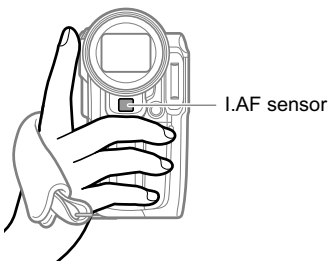


1 Turn on the camcorder.

The lens cover will open automatically.

2 Adjust the viewfinder.
Keep the LCD panel closed to use the viewfinder and adjust the dioptric adjustment lever as necessary.

3 Fasten the grip belt.
Adjust the grip belt so that you can reach the zoom lever with your index finger, and the start/stop button with your thumb.



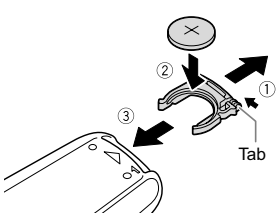
NOTES

To make use of the full capabilities of the instant AF function (📖 31), be careful not to obstruct the I.AF sensor.

The Wireless Controller

Inserting the Battery

(Lithium Button Battery CR2025)

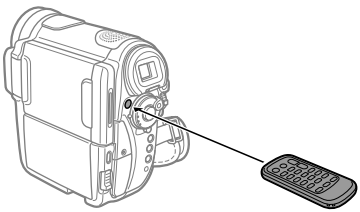


1 Press the tab in the direction of the arrow and pull out the battery holder.

2 Place the lithium button battery with the + side facing up.

3 Insert the battery holder.

Using the Wireless Controller



Point the controller at the camcorder's remote sensor when you press the buttons.

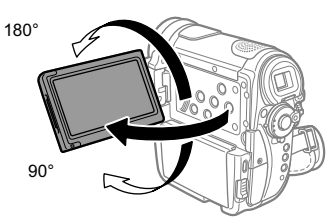
NOTES

- The wireless controller may not work properly when the remote sensor is situated under strong light sources or direct sunlight.
- If the wireless controller does not work, check that [WL.REMOTE] is not set to [OFF] (📖 37). Otherwise, replace the battery.

Adjusting the LCD Screen

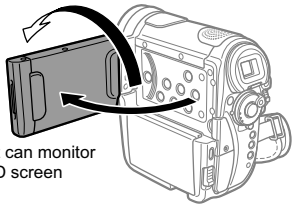
Rotating the LCD Panel

Open the LCD panel 90 degrees.
You can rotate the panel 90 degrees downward.



You can rotate the panel 180 degrees toward the lens (allowing the subject to monitor the LCD screen while you use the viewfinder). Rotating the panel 180

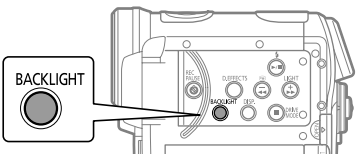
degrees is also useful if you wish to include yourself when recording with the self timer.



Subject can monitor the LCD screen

LCD Backlight

You can set the brightness of the LCD screen at normal or bright.



Press [BACKLIGHT]**.**
Repeatedly pressing [BACKLIGHT] toggles between the normal and bright settings.

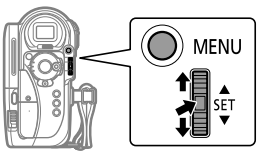
NOTES

- This setting does not affect the brightness of the recording or the viewfinder screen.
- Using the bright setting will shorten the effective usage time of the battery pack.
- The LCD brightness can also be changed from the menu (📖 36).

Using the Menus

Many of the camcorder's functions can be adjusted from the menus that open after pressing the MENU button ([MENU]) and the FUNC. button ([FUNC.]).
For details about the available menu options and settings, refer to *Menu Options Lists - MENU/FUNC.* (📖 31).

Selecting a MENU Option

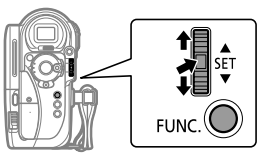


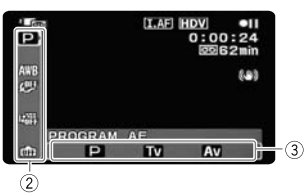


1 **Press** [MENU]**.**
2 **Select (▲▼) the desired menu from the left side column and press** [SET]**.**
The title of the selected menu appears on top of the screen and under it the list of settings.
3 **Select (▲▼) the setting you want to change and press** [SET]**.**
• An orange frame will indicate the menu item currently selected. Menu items not available will appear grayed out.
• To return to the menu selection screen, select (▼) [↩ RETURN] and press [SET].

4 **Select (▲▼) the desired option and press SET to save the setting.**
5 **Press MENU.**
You can press MENU to close the menu at any time.

Selecting a FUNC. Menu Option





1 **Press FUNC.**
2 **Select (▲▼) the icon of the function you want change from the left side column and press SET.**
3 **Select (▲▼) the desired setting from the available options at the bottom bar.**
The selected option will be highlighted in light blue. Menu items not available will appear grayed out.
4 **Press FUNC. to save the settings and close the menu.**
• You can press FUNC. to close the menu at any time.
• With some settings you will need to press SET and make further selections. Follow the additional operation guides that will appear on the screen (such as the SET icon, small arrows, etc.).

First Time Settings

Changing the Language

Options ♦ Default value

[DEUTSCH]	[РУССКИЙ]
[ENGLISH]♦	[简体中文]
[ESPAÑOL]	[繁體中文]
[FRANÇAIS]	[한국어]
[ITALIANO]	[ภาษาไทย]
[POLSKI]	[日本語]

DISPLAY SETUP/💬

⇩

LANGUAGE **ENGLISH♦**

MENU (📖 22) MENU SET

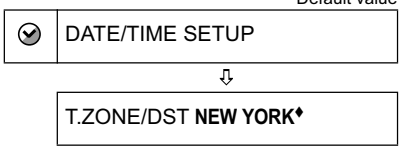
1 **Press MENU.**
2 **Select (▲▼) [DISPLAY SETUP/💬] and press SET.**
3 **Select (▲▼) [LANGUAGE] and press SET.**
4 **Select (▲▼) the desired option and press SET.**
5 **Press MENU to close the menu.**

NOTES

● If you changed the language by mistake, follow the 💬 mark next to the menu item to change the setting.
● The displays SET and MENU that appear in some menu screens will not change, regardless of the language selected.

Changing the Time Zone

♦ Default value



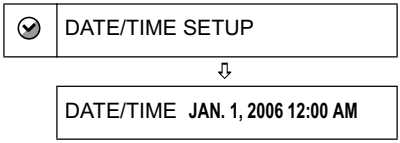
MENU (📖 22) MENU SET

1 **Press** MENU.
2 **Select (▲▼) [DATE/TIME SETUP] and press** SET.
3 **Select (▲▼) [T.ZONE/DST] and press** SET.
The time zone setting appears. The default setting is New York.
4 **Select (▲▼) your time zone and press** SET.
To adjust for daylight saving time, select the time zone with the ☀ mark next to the area.

Time Zones

Once you have set the time zone, date and time, you do not need to reset the clock every time you travel to another time zone. Select the time zone referring to the date and time displayed on the screen.

Setting the Date and Time



MENU (📖 22) MENU SET

1 **Press** MENU.
2 **Select (▲▼) [DATE/TIME SETUP] and press** SET.
3 **Select (▲▼) [DATE/TIME] and press** SET.
Blinking arrows will be displayed around the month.
4 **Select (▲▼) the month and press** SET.
• Blinking arrows will be displayed around the next field in the date/time.
• Set the day, year, hours and minutes in the same way.
5 **Press** MENU **to close the menu and start the clock.**

IMPORTANT

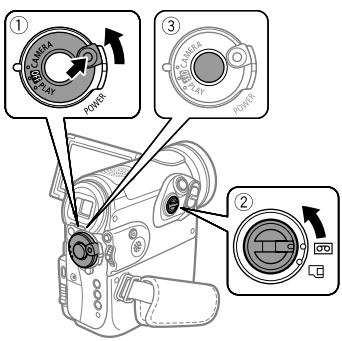
- When you do not use the camcorder for about 3 months, the built-in rechargeable lithium battery may discharge completely and the date and time setting may be lost. In such case, recharge the battery (📖 81) and set the time zone, date and time again.
- You can also change the date format (📖 37).

Recording

Recording Movies

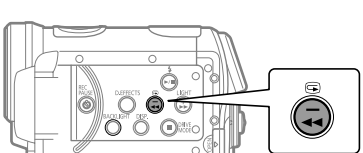
Before You Begin Recording
Make a test recording first to check if the camcorder operates correctly. If necessary, clean the video heads (📖 82).

CAMERA | CAMERA | PLAY | PLAY (📖 10)



1 **Holding the lock button pressed down, set the POWER switch to CAMERA.**
2 **Move the / switch to (tape).**
If necessary, you can change the recording standard (HDV or DV) (📖 32).
3 **Press Start/Stop to begin recording.**
Press Start/Stop again to pause the recording.

To review the last scene recorded



Press .
The camcorder will play back a few seconds of the last recording made and return to record pause mode. If the currently selected recording standard is different from that of the last recording, the picture may not be played back correctly.

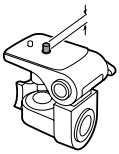
When you have finished recording

1 **Close the LCD panel.**
2 **Turn off the camcorder.**
3 **Remove the tape.**
4 **Disconnect the power source and remove the battery pack.**

NOTES

- Previous recordings overwritten by a new recording cannot be recovered. Before you start recording, search for the end of the last recording (📖 28).
- To protect the tape and video heads, the camcorder will enter the stop mode (■) if left in record pause (● ❚❚) mode for 4 minutes 30 seconds. To resume recording press Start/Stop.
- When recording in very loud places (such as fireworks shows or concerts), sound may become distorted or it may not be recorded at the actual levels. This is not a malfunction.
- **About the Power Save mode**: To save power when the camcorder is powered by a battery pack, the camcorder will automatically shut off if left without any operations for 5 minutes (📖 37). To restore the power, turn the camcorder off and then on again.
- **About the LCD and viewfinder screen**: The screens are produced using extremely high-precision manufacturing techniques, with more than 99.99% of the pixels operating to specification. Less than 0.01% of the pixels may occasionally misfire or appear as black, red, blue or green dots. This has no effect on the recorded image and does not constitute a malfunction.

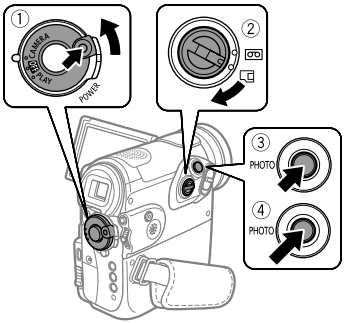
● **When using a tripod**: Do not leave the viewfinder exposed to direct sunlight as it may melt (due to concentration of the light by the lens). Do not use tripods with fastening screws longer than 5.5 mm (0.2 inch). Doing so may damage the camcorder.



Recording Still Images

Before using a memory card for the first time, be sure to initialize it with this camcorder (📖 56).

CAMERA CAMERA | PLAY PLAY (📖 10)



1 **Holding the lock button pressed down, set the POWER switch to CAMERA.**
2 **Move the 📼/💾 switch to 💾 (memory card).**
3 **Press PHOTO halfway.**
• Once the focus is automatically adjusted, ◎ will turn green and one or more AF frames appear.
• When you press PHOTO on the wireless controller, the still image is recorded immediately.
4 **Press PHOTO fully.**
The CARD access indicator will flash as the image is being recorded.

IMPORTANT

Avoid the following actions while the card access display (▶ 💾) appears on screen and when the CARD access indicator is on or flashing. Failing to do so may result in permanent data loss.
- Do not open the memory card slot cover and do not remove the memory card.
- Do not disconnect the power source or turn off the camcorder.
- Do not change the position of the 📼/💾 switch or the operating mode.

NOTES

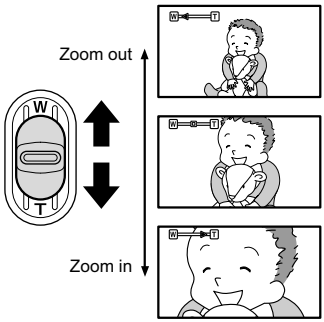
● If the subject is not suitable for autofocus, ◎ turns yellow. Adjust the focus manually (📖 44).
● When the subject is too bright, "OVEREXP." starts flashing. In such case, use the optional FS-H37U ND filter.

Zooming

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (📖 10)

CAMERA·📼: In addition to the 10x optical zoom, the 200x digital zoom is also available (📖 31).



10x Optical Zoom

Move the zoom lever toward W to zoom out (wide-angle). Move it toward T to zoom in (telephoto).
You can also change the zoom speed (🕮 31). You can select one of three fixed zoom speeds or a variable speed that depends on how you operate the zoom lever: Press gently for a slow zoom; press harder for faster zooms.

NOTES

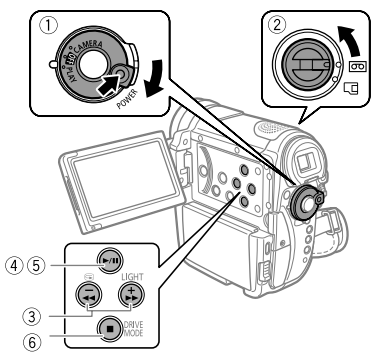
- You can also use the **T** and **W** buttons on the wireless controller. The zoom speed with the wireless controller will be the same as with the camcorder (when one of the fixed zoom speed levels is selected) or fixed at [SPEED 3] (when [VARIABLE] is selected).
- When set to [VARIABLE], the zoom speed will be faster in the record pause mode.
- Keep at least 1 m (3.3 ft.) to the subject. At wide-angle, you can focus on a subject as close as 1 cm (0.39 in.).

Playback

Playing Back Movies

Play back the tape on the LCD display or close the LCD panel to use the viewfinder.

CAMERA | CAMERA | **PLAY** | PLAY (🕮 10)



1. **Holding the lock button pressed down, set the POWER switch to PLAY.**
2. **Move the 📼/📷 switch to 📼 (tape).**
3. **Locate the point where you want to begin the playback.**
 Press ◄◄ to rewind or ►► to fast forward the tape.
4. **Press ►/II to begin the playback.**
 If necessary, adjust (▲▼) the volume with the SET dial (🔊).

During Playback

5. **Press ►/II again to pause the playback.**
6. **Press ■ to stop the playback.**

Special Playback Modes

To operate the special playback modes use the buttons on the wireless controller. There is no sound during the special playback modes. To return to normal playback from the special playback modes, press [▶/❚❚].

- **Fast Playback:** During normal playback press [◀◀]/[▶▶]. Keep the button pressed to rewind/fast forward the tape while continuing the playback.
- **Reverse Playback:** During normal playback press [–/◀❚❚].
- **Frame Reverse/Advance:** During playback pause press [–/◀❚❚]/[+/❚❚▶]. Keep pressed for continuous frame-by-frame playback.
- **Slow Playback:** During normal or reverse playback press [SLOW▸].
- **Double Speed Playback:** During normal or reverse playback press [×2].

NOTES

- You can display the date and time of the recording and other camcorder data registered when the recording was made (📖 51).
- During some special playback modes, you may notice some video problems (blocky video artifacts, banding, etc.) in the playback picture.
- During playback, you may notice some video problems at the point where the standard of the recording (HDV/DV) changes.
- **During the playback of HDV recordings:** Even though their icons will appear on screen, the following special playback modes are not available.
 - Reverse slow playback
 - Frame reverse
 - Double speed playback (forward or reverse)
- To protect the tape and video heads, the camcorder will enter the stop mode (■) if left in playback pause (▶❚❚) mode for 4 minutes 30 seconds. To resume the playback press [▶/❚❚].
- Sound from the built-in speaker will be muted while the STV-250N Stereo Video Cable is connected to the camcorder.

Returning to a Pre-marked Position

If you wish to return to a particular scene later, mark the point with the zero set memory and the tape will stop at that point when you rewind/fast forward the tape.

CAMERA CAMERA | PLAY PLAY (📖 10)

1. **While recording or during playback, press [ZERO SET MEMORY] on the wireless controller at the point you wish to return to later.**
 - The time code changes to "0:00:00 M".
 - Press [ZERO SET MEMORY] again to cancel the memory.
2. **If you marked the zero memory while recording, set the camcorder to [PLAY·📼] mode. If you marked the zero memory during playback, press [■].**
3. **Press [◀◀] to locate the zero mark.**
 - If the tape counter shows a negative number, press [▶▶] instead.
 - [◀◀] appears and the camcorder rewinds/fast forwards the tape.
 - The tape stops at or near the zero mark, M disappears and the correct time code will be displayed again.

NOTES

If there are blank sections between recordings, the zero set memory may not work correctly.

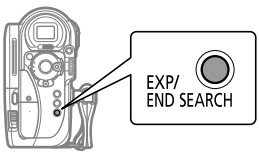
Locating the End of the Last Scene

After playing back a tape, use this function to locate the end of the last scene recorded in order to continue recording form that point.

POINTS TO CHECK

CAMERA | CAMERA | PLAY | PLAY

Stop the playback before using this function.



Press [END SEARCH].
• "END SEARCH" appears.
• The camcorder rewinds/fast forwards the tape, plays back the last few seconds of the recording and stops the tape.
• To cancel the search press [END SEARCH] again.

NOTES

● End search cannot be used once you remove the cassette.
● If there are blank sections between recordings, or sections recorded in different standards (HDV/DV) on the same tape, the end search may not work correctly.

Locating Scenes by Recording Date

You can locate the change of the date/ time zone with the date search function.

CAMERA | CAMERA | PLAY | PLAY

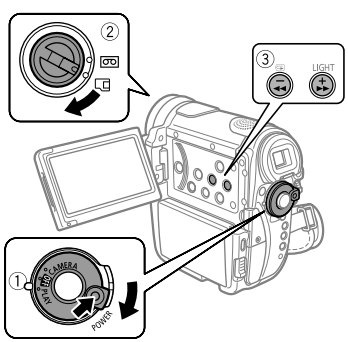
Press [⏮] or [⏭] on the wireless controller.
• Press more than once to search for further date changes (up to 10 times).
• To cancel the search press [STOP■].

NOTES

● Recordings shorter than 1 minute per date/ time zone cannot be located with this function.
● Date search may not function if the date, time or data code are not correctly displayed.
● If there are sections recorded in different standards (HDV/DV) on the same tape, the date search may not work correctly.

Viewing Still Images

CAMERA | CAMERA | PLAY | PLAY (📖 10)



1 Holding the lock button pressed down, set the POWER switch to PLAY.
2 Move the 🎞/💾 switch to 💾 (memory card).
3 Press [+] or [−] to move between the images.

IMAGE JUMP

You can jump ahead to a specific image without having to browse all images one by one.
Press [+]/[−] and hold it pressed down. Release the button when the image number gets to the image you want to display.

IMPORTANT

● Avoid the following actions while the card access display ▶ appears on screen, and when the CARD access indicator is on or flashing. Failing to do so may result in permanent data loss.
- Do not open the memory card slot cover and do not remove the memory card.
- Do not disconnect the power source or turn off the camcorder.
- Do not change the position of the / switch or the operating mode.

● The following may not be displayed correctly.
- Images not recorded with this camcorder.
- Images edited on or uploaded from a computer.
- Images whose file names have been changed.

Slideshow

	SLIDESHOW

FUNC.
(📖 23) FUNC. SET

1 **Press** [FUNC.].
2 **Select (▲▼) [SLIDESHOW] and press** [SET].
3 **Select (▲▼) [START] and press** [SET].
Press [FUNC.] to stop the slideshow.

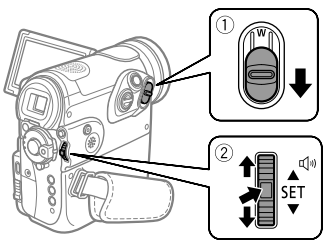
Index Screen

1 **Move the zoom lever toward W.**
The index screen appears.
2 **Select (▲▼) an image.**
• Move the cursor ☞ to the image you want to view.
• Press [+] or [−] to move to the next/previous index page.
3 **Move the zoom lever toward T.**
The index screen closes and the selected image is displayed.

Magnifying the Playback Image

During playback, movies and still images can be magnified up to 5 times. You can also select the area to be magnified.

CAMERA CAMERA | PLAY PLAY (📖 10)



1 **Move the zoom lever toward T.**
• The image is magnified by 2 times and a frame appears indicating the position of the magnified area.
• To further enlarge the image, move the zoom lever toward **T**. To reduce the magnification, move the zoom lever toward **W**.
• will appear for images that cannot be enlarged.
2 **Select the enlarged area of the picture with the** [SET] **dial.**
• Move (▲▼) the frame right/left or up/down. Press [SET] to change between the directions.
• To cancel the magnification, move the zoom lever toward **W** until the frame disappears.

Menu Options Lists

Menu items not available appear in black on the screen. For details about how to select an item, refer to *Using the Menus* (🕮 22).

MENU Options

CAMERA SETUP

A.SL SHUTTER

CAMERA CAMERA | PLAY PLAY

Mode switch: P, AUTO

[ON ON], [OFF OFF]

The camcorder automatically uses slow shutter speeds to obtain brighter recordings in places with insufficient lighting.

- The camcorder uses shutter speeds down to 1/30 (1/15 in CAMERA mode).
- CAMERA: Set the flash mode to ⊘ (flash off).
- If a trailing afterimage appears, set the slow shutter to [OFF OFF].
- If (camcorder shake warning) appears, we recommend stabilizing the camcorder, for example, by mounting it on a tripod.

D.ZOOM

CAMERA CAMERA | PLAY PLAY

[OFF OFF], [40x 40X], [200x 200X]

Determines the operation of the digital zoom.

- When activated, the camcorder will switch automatically to the digital zoom when you zoom in beyond the optical zoom range.
- With the digital zoom the image is digitally processed, so the image resolution will deteriorate the more you zoom in.
- The digital zoom indicator will appear in light blue from 10x up to 40x and dark blue from 40x up to 200x.
- The digital zoom cannot be used with the [NIGHT] recording program (SCN).
- A still image cannot be simultaneously recorded on the memory card while recording movies using the digital zoom.

ZOOM SPEED

CAMERA CAMERA | PLAY PLAY

[VAR. VARIABLE], [SPEED 3], [SPEED 2], [SPEED 1]

- When set to [VAR. VARIABLE] the zoom speed depends on how you operate the zoom lever: Press lightly for a slow zoom; press harder for faster zooms.
- The fastest zoom speed can be achieved with [VAR. VARIABLE]. Among the fixed zoom speeds, [SPEED 3] is the fastest and [SPEED 1] the slowest.

AF MODE

CAMERA CAMERA | PLAY PLAY

[I.AF INSTANT AF], [AF NORMAL AF]

Select how fast the autofocus will operate.

- With [I.AF INSTANT AF] the autofocus adjusts quickly to a new subject. This is convenient for example when changing the focus from a near subject to a far subject in the background, or when recording fast moving subjects.
- Set the AF mode to [AF NORMAL AF] when you attach the optional Wide-converter or Tele-converter to the camcorder.

AF AST LAMP (📖 52)

CAMERA CAMERA | PLAY PLAY

[AUTO], [OFF]

FOCUS PRI.

CAMERA CAMERA | PLAY PLAY

[ON], [OFF]

The camcorder records the still image only after the focus has been adjusted.

- Set it to [OFF] if you wish to record a still image as soon as you press PHOTO. When set to [OFF], no focusing frame appears.
- Focus priority cannot be turned off when the mode switch is set to AUTO.
- In the [FIREWORKS] recording program (SCN) the focus priority is automatically set to [OFF].

IMG STAB

CAMERA CAMERA | PLAY PLAY

Mode switch: P, SCN

[ON], [OFF]

The image stabilizer compensates for camcorder shake even at full telephoto.

- The image stabilizer is designed to compensate for a normal degree of camcorder shake.
- The image stabilizer may not be effective when recording in dark places using the [NIGHT] recording program (SCN).
- The image stabilizer cannot be turned off when the mode switch is set to AUTO.
- We recommend setting the image stabilizer to [OFF] when using a tripod.

REC/IN SETUP

HD STANDARD

CAMERA CAMERA | PLAY PLAY

[HDV], [DV(WIDE)], [DV(NORMAL)]

Selects the video standard of the recording and in DV standard also the aspect ratio.

[HDV]: High definition video at 1080i specifications with 16:9 aspect ratio.

[DV(WIDE)]: Standard definition digital video with 16:9 aspect ratio.

[DV(NORMAL)]: Standard definition digital video with 4:3 aspect ratio.

- We recommend not mixing recordings made in different video standards on the same tape.
- **Playing back a widescreen recording:** TV sets compatible with the Video ID-1 system will automatically switch to wide (16:9) mode. Otherwise, change the aspect ratio of the TV manually. To play back on a TV with normal aspect ratio (4:3) change the [TV TYPE] setting accordingly (📖 34).

DV REC MODE DV

CAMERA CAMERA | PLAY PLAY

[SP STD PLAY], [LP LONG PLAY]

When [HD STANDARD] is set to one of the DV standards you can change the video quality and as a result, also the available recording time.

- Recording in LP mode extends the available recording time on the tape 1.5 times.
- Depending on the condition of the tape (long usage, imperfections, etc.) you may notice some video problems (blocky video artifacts, banding, etc.) in the playback picture when playing back recordings

made in LP mode. We recommend using the SP mode for important recordings.
- If you make recordings in both SP and LP modes on the same tape, during playback you may notice some video problems in the picture at the point where the recording mode changes.
- When playing back in this camcorder tapes recorded in LP mode with other devices or vice versa, you may notice some problems in the playback picture or the sound may stop briefly.

DV AUDIO DV



[16bit 16bit], **[12bit 12bit]**
When [HD STANDARD] is set to one of the DV standards you can change the audio quality.
[16bit 16bit]: To record sound at the highest quality.
[12bit 12bit]: If you will dub audio or add a music track later with an external device.

WIND SCREEN



Mode switch: P, SCN
[A AUTO], [OFF OFF]
The camcorder automatically reduces the background sound of wind when recording outdoors.
- The wind screen cannot be turned off when the mode switch is set to AUTO.

REVIEW



[OFF OFF], **[2s 2sec]**, [4s 4sec], [6s 6sec], [8s 8sec], [10s 10sec]
Selects the time to display a still image after it has been recorded.
- You can erase (📖 55) or protect (📖 55) the image if you press FUNC. while you are reviewing the image (or immediately after recording it, if set to [OFF OFF]).
- This menu item will not be available when (continuous shooting), (high-speed continuous shooting) or (auto exposure bracketing) is selected.
- If you press DISP. while reviewing a still image, it will continue to be displayed indefinitely. Press PHOTO half way to return to the normal display.

AV➡DV (📖 63)



[ON ON], **[OFF OFF]**

FILE NOS.



[RESET], **[CONTINUOUS]**
Select the image numbering method to be used when you insert a new memory card.
Images are automatically assigned consecutive image numbers from 0101 to 9900, and stored in folders containing up to 100 images. Folders are numbered from 101 to 998.
[RESET]: Image numbers will restart from 101-0101 every time you insert a new memory card.
[CONTINUOUS]: Image numbers will continue from the number following that of the last image recorded with the camcorder.
- If the memory card you insert already contains an image with a larger number, a new image will be assigned a number one higher than that of the last image on the memory card.

● We recommend using the [CONTINUOUS] setting.

CARD OPERATIONS

PRINT ORD.ALL ERASE (📖 72)



[NO], [YES]

TRANS.ORD.ALL ERASE (📖 68)



[NO], [YES]

ERASE ALL IMAGES (📖 55)



[NO], [YES]

INITIALIZE (📖 56)



[NO], [YES]

* The following options are available only when you press MENU in the index screen.

➡ PROTECT* (📖 55)



[NO], [YES]

➡ PRINT ORDER* (📖 71)



[NO], [YES]

➡ TRANSFER ORDER* (📖 67)



[NO], [YES]

PLAY/OUT SETUP

PLAYBACK STD



[A AUTO], [HDV HDV], [DV DV]
Select the video standard to be used for playback.
[A AUTO]: Switches automatically between standards (HDV/DV) during playback.
[HDV HDV], [DV DV]: Plays back only the recordings made in the selected standard.

TV TYPE



[4:3 NORMAL TV], **[16:9 WIDE TV]**
In order to display the picture in full and in the correct aspect ratio, select the setting according to the type of television to which you will connect the camcorder.
[NORMAL TV]: TV sets with 4:3 aspect ratio.
[WIDE TV]: TV sets with 16:9 aspect ratio.

OUTPUT CH



[L/R], [L/L], [R/R]
You can select the audio channel to use during the playback of a tape with audio recorded on two channels.
[L/R]: Left and Right channels (stereo) / Main + Sub tracks (bilingual).
[L/L]: Left channel only (stereo) / Main track only (bilingual).
[R/R]: Right channel only (stereo) / Sub track only (bilingual).

AUDIO OUT

CAMERA | CAMERA | PLAY | PLAY

[ST-1 STEREO1], [ST-2 STEREO2], [1:1 MIX/FIXED], [MIX/VAR.]

You can select the audio track to use during the playback of a tape with audio dubbed over the recording.

[ST-1 STEREO1]: Original sound only.

[ST-2 STEREO2]: Dubbed audio only.

[1:1 MIX/FIXED]: Mixed audio with the original sound and dubbed audio at the same level.

[MIX/VAR.]: Mixed audio where the balance between the original sound (ST-1) and the dubbed audio (ST-2) can be adjusted.

MIX BALANCE

CAMERA | CAMERA | PLAY | PLAY

ST-1 ST-2

When [AUDIO OUT] is set to [MIX/VAR.], adjust (▲▼) the sound balance with the SET dial.

- The camcorder will retain the audio balance adjustment, however if you turn off the camcorder [AUDIO OUT] will be reset to [ST-1 STEREO1].

COMP.OUT

CAMERA | CAMERA | PLAY | PLAY

[480i 480i], **[1080i 1080i/480i]**

You can select the video specifications to use to connect the camcorder to a high-definition TV using the video component connection.

[480i 480i]: To use the 480i specification (standard definition TV).

[1080i 1080i/480i]: To use the full 1080i high definition specification when possible, or switch automatically to 480i specification when 1080i is not supported by the TV.

- Select the [PLAYBACK STD] and [COMP.OUT] settings according to the specifications you want to use for playback on a high-definition TV. Refer to the table below.
- When the playback standard selected is different from that of the original recording, there will be no playback picture.

DV OUTPUT

CAMERA | CAMERA | PLAY | PLAY

[DV DV LOCKED], **[HDV/DV HDV/DV]**

You can select the video standard to use when connecting to an external device using the HDV/DV terminal.

[HDV/DV HDV/DV]: Switch automatically between standards to match the original standard of the recordings.

[DV DV LOCKED]: All video output will be in DV standard (recordings made in HDV will be down-converted).

- The DV output cannot be changed while a DV cable is connected to the HDV/DV terminal.

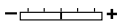
Settings for Video Output from the COMPONENT OUT Terminal

Standard to Use for Playback	Original Standard of the Recording	[PLAYBACK STD] Setting	[COMP.OUT] Setting
HDV (1080i)	HDV	[A AUTO] or [HDV HDV]	[1080i 1080i/480i]
DV (480i)	HDV	[A AUTO] or [HDV HDV]	[480i 480i]
	DV	[A AUTO] or [DV DV]	[1080i 1080i/480i] or [480i 480i]

DISPLAY SETUP

BRIGHTNESS

CAMERA CAMERA | PLAY PLAY



Adjust (▲▼) the brightness of the LCD display with the SET dial.

● Changing the brightness of the LCD display does not affect that of the viewfinder or the recordings.

MARKERS

CAMERA CAMERA | PLAY PLAY

[OFF OFF], [LEVEL(WHT)], [LEVEL(GRY)], [GRID(WHT)], [GRID(GRY)]

You can display a grid or a horizontal line at the center of the screen. The markers are available in white or gray. Use the markers as a reference to make sure your subject is framed correctly (vertically and/or horizontally).

● Using the markers will not affect the recordings on the tape or memory card.

ASSIST FUNC.

CAMERA CAMERA | PLAY PLAY

[OFF OFF], [ZEBRA(70%)], [ZEBRA(100%)], [PEAK PEAKING]

You can use the assist functions to make sure you adjust the focus and exposure correctly.

[ZEBRA]: A striped pattern (zebra pattern) will appear over areas of the picture that are overexposed (too bright). [ZEBRA(70%)] is more sensitive than [ZEBRA(100%)].

[PEAK PEAKING]: The silhouettes of objects in the picture will be emphasized in order to allow you to focus manually more easily.

● Using the assist functions will not affect the recordings on the tape or memory card.

TV SCREEN

CAMERA CAMERA | PLAY PLAY

[ON ON], [OFF OFF]

When set to [ON ON], the camcorder's on-screen displays will appear also on the screen of a connected TV or monitor.

● You can also use DISP. on the wireless controller.

● When the date and time are displayed on the camcorder's screen they will also appear on a connected TV regardless of the [TV SCREEN] setting. Turn off the date and time by repeatedly pressing DISP..

6SEC.DATE

CAMERA CAMERA | PLAY PLAY

[ON ON], **[OFF OFF]**

When you start playing back a tape or when the date of the recording changes, the date and time will be displayed for 6 seconds.

DATA CODE

(📖 50)

CAMERA CAMERA | PLAY PLAY

[DATE], [TIME], **[DATE & TIME]**, [CAMERA DATA], [CAM. & D/T]

LANGUAGE

(📖 23)

CAMERA CAMERA | PLAY PLAY

[DEUTSCH], **[ENGLISH]**, [ESPAÑOL], [FRANÇAIS], [ITALIANO], [POLSKI], [РУССКИЙ], [简体中文], **[繁體中文]**, [한국어], [ภาษาไทย], [日本語]

DEMO MODE

CAMERA CAMERA | PLAY PLAY

[ON ON], [OFF OFF]
The demonstration mode displays the camcorder's main features. It starts automatically when the camcorder is powered with the power adapter if you leave it turned on without loading a recording media for more than 5 minutes.
● To cancel the demo mode once it started, press any button, turn off the camcorder or load a recording media.

SYSTEM SETUP

WL.REMOTE

CAMERA CAMERA | PLAY PLAY

[ON ON], [OFF OFF]
Allows the camcorder to be operated with the wireless controller.

BEEP

CAMERA CAMERA | PLAY PLAY

[HIGH VOLUME],
[LOW VOLUME], [OFF OFF]
A beep will accompany some operations like turning on the camcorder, the self-timer countdown, etc. It also serves as a warning beep under unusual conditions.

POWER SAVE

CAMERA CAMERA | PLAY PLAY

[ON ON], [OFF OFF]
In order to save power when the camcorder is powered by a battery pack, it will automatically shut off if left without any operation for five minutes. Approximately 30 seconds before the camcorder shuts off, the message "AUTO POWER OFF" will appear.

HDV ILLUM.

CAMERA CAMERA | PLAY PLAY

[ON ON], [OFF OFF]
Select whether to turn on/off the illumination of the HDV logo (external side of the LCD panel).

FIRMWARE

CAMERA CAMERA | PLAY PLAY

You can verify the current version of the camcorder's firmware. This menu option is usually grayed out.

DATE/TIME SETUP

CAMERA CAMERA | PLAY PLAY

T.ZONE/DST (📖 24)

DATE/TIME (📖 24)

DATE FORMAT

[Y.M.D (2006.1.1 AM 12:00)],
[M.D,Y (JAN. 1, 2006 12:00 AM)],
[D.M.Y (1.JAN.2006 12:00 AM)]
Changes the date format for on-screen displays and for date printing.

FUNC. Menu Options

Recording programs (📖 40)

CAMERA CAMERA | PLAY PLAY

Mode switch: P
[P PROGRAM AE],
[Tv SHUTTER-PRIO. AE],
[Av APERTURE-PRIO. AE]
Mode switch: SCN
[PORTRAIT], [SPORTS],
[NIGHT], [SNOW], [BEACH],
[SUNSET], [SPOTLIGHT],
[FIREWORKS]

Light metering mode (📖 43)



Mode switch: P
[EVALUATIVE],
[CENT.WEIGHT.AVERAGE],
[SPOT]

White balance (📖 45)



Mode switch: P
[AUTO], [DAYLIGHT],
[SHADE], [CLOUDY],
[TUNGSTEN], [FLUORESCENT],
[FLUORESCENT H], [SET]

Image effect (📖 46)



Mode switch: P
[IMAGE EFFECT OFF], [VIVID],
[NEUTRAL],
[LOW SHARPENING],
[SOFT SKIN DETAIL],
[CUSTOM]

Drive mode (📖 49)



Mode switch: P, SCN
[SINGLE], [CONT.SHOOT.],
[HISPEED CONT.SHOOT.],
[AEB]

Digital effects (📖 53)



Mode switch: P, SCN
[D.EFFECT OFF], [FADER],
[EFFECT]



Mode switch: P, SCN
[D.EFFECT OFF], [BLK&WHT]

Still image simultaneous recording (📖 48)



Size:
- [HD STANDARD] set to [HDV]/ [DV(WIDE)]:
[STILL I.REC OFF],
[LW 1920x1080], **[SW** 848x480]
- [HD STANDARD] set to [DV(NORMAL)]:
[STILL I.REC OFF],
[M 1440x1080], **[S** 640x480]

Quality:
[SUPER FINE], **[FINE]**,
[NORMAL]

Still image size/quality (📖 47)



Size:
[LW 1920x1080], **[L 2048x1536],**
[M 1440x1080], **[S** 640x480]

Quality:
[SUPER FINE], **[FINE]**,
[NORMAL]

Still image capturing (📖 49)

CAMERA | CAMERA | **PLAY** | PLAY

Recordings made in [HDV HDV]:
[LW S.FINE/1920x1080],
[LW FINE/1920x1080],
[LW NORMAL/1920x1080]
Recordings made in [DV DV(WIDE)]:
[SW S.FINE/848x480],
[SW FINE/848x480],
[SW NORMAL/848x480]
Recordings made in [DV DV(NORMAL)]:
[S S.FINE/640x480],
[S FINE/640x480],
[S NORMAL/640x480]

IMAGE ERASE (📖 55)

CAMERA | **CAMERA** | PLAY | **PLAY**

[CANCEL], [ERASE]
Erase a still image.
CAMERA·📷: This option will appear only when the drive mode is set to [□ SINGLE] and you press FUNC. within the time set for the [REVIEW] option (or immediately after recording the still image, if set to [OFF OFF]).

SLIDESHOW (📖 30)

CAMERA | CAMERA | PLAY | **PLAY**

[CANCEL], [START]

PRINT ORDER (📖 71)

CAMERA | CAMERA | PLAY | **PLAY**

[🖨 0] - [🖨 99] COPIES
Set a print order for a still image on the memory card.

TRANSFER ORDER (📖 67)

CAMERA | CAMERA | PLAY | **PLAY**

[TRANS.ORDER OFF],
[TRANS.ORDER ON]
Set a transfer order for a still image on the memory card.

PROTECT (📖 55)

CAMERA | **CAMERA** | PLAY | **PLAY**

[PROTECT OFF],
[PROTECT ON]
Protect a still image on the memory card.
CAMERA·📷: This option will appear only when the drive mode is set to [□ SINGLE] and you press FUNC. within the time set for the [REVIEW] option (or immediately after recording the still image, if set to [OFF OFF]).

Using the Recording Programs



AUTO Auto

The camcorder adjusts the focus, exposure and other settings automatically, allowing you to just point and shoot.



P : Flexible Recording Programs (📖 41)

[P PROGRAM AE]
The camcorder sets the aperture and shutter speed.

[Tv SHUTTER-PRIO. AE]
You select the shutter speed.

[Av APERTURE-PRIO. AE]
You select the aperture value.

SCN: Special Scene Recording Programs (📖 42)

[PORTRAIT]
The camcorder uses a large aperture, achieving a focus on the subject while blurring other distracting details.



[SNOW]
Use this mode to record in bright ski resorts. It prevents the subject from being underexposed.



[SPOTLIGHT]
Use this mode to record spotlit scenes.



[SPORTS]
Use this mode to record sports scenes such as tennis or golf.



[BEACH]
Use this mode to record on a sunny beach. It prevents the subject from being underexposed.



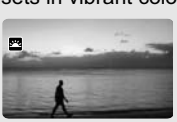
[FIREWORKS]
Use this mode to record fireworks.



[NIGHT]
Use this mode to record in low-light conditions.



[SUNSET]
Use this mode to record sunsets in vibrant colors.



E

P Flexible Recording: Changing the Aperture and Shutter Speed

Use the automatic exposure (AE) program or give priority to the exposure value or the shutter speed.

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (10)

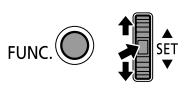
Mode switch: P



Options ♦ Default value

[P PROGRAM AE]♦
The camcorder automatically adjusts the aperture and shutter speed to obtain the optimal exposure for the subject.
[Tv SHUTTER-PRIO.AE]
Set the shutter speed value. The camcorder automatically sets the appropriate aperture value. Use a high shutter speed to record fast moving subjects or a slow shutter speed to add a certain motion blur, emphasizing the feel of movement.
[Av APERTURE-PRIO.AE]
Set the aperture value. The camcorder automatically sets the appropriate shutter speed. Use low aperture values (larger lens opening) to softly blur the background in a portrait or high aperture values (smaller lens opening) to get a wider depth of field, giving a sharp focus all throughout a landscape.

FUNC. (23)



FUNC. ⇨ Icon of the currently selected **Recording Program**

⇩

FUNC. ⇦ Desired option

TO SET THE APERTURE VALUE OR SHUTTER SPEED

1 **Press** SET.

2 **Select (▲▼) the desired value and press** SET.

Shutter speed guidelines

CAMERA	1/8, 1/15, 1/30
CAMERA	1/2, 1/4, 1/8, 1/15, 1/30
For recording subjects in dark places.	
CAMERA	1/60
CAMERA	1/60
For general recordings.	
CAMERA	1/100
CAMERA	1/100
For recording indoor sports scenes.	
CAMERA	1/250, 1/500, 1/1000
CAMERA	1/250, 1/500
For recording from within a car or train, or for recording moving subjects such as roller coasters.	
CAMERA	1/2000
For recording outdoor sports such as golf or tennis on sunny days.	

Note that on screen only the denominator is displayed – [Tv 250] indicates a shutter speed of 1/250, etc.

NOTES

- Do not change the position of the mode switch while recording as the brightness of the image may change abruptly.
- When setting a numeric value (aperture or shutter speed), the number display will flash if the aperture or shutter speed is not appropriate for the recording conditions. In such case, select a different value.

● [Tv SHUTTER-PRIO.AE]
- When using a slow shutter speed in dark places, you can obtain a brighter image, but the image quality may be lower, and the autofocus may not work well.
- The image may flicker when recording with high shutter speeds.
- **Recording movies under fluorescent lights:** If the screen starts to flicker, select [Tv SHUTTER-PRIO.AE] and set the shutter speed to 1/100.

● [Av APERTURE-PRIO.AE]
- **About the available aperture values:** Below is a list of all available aperture values. However, the actual range of values available for selection will vary depending on the initial zoom position.

Available Aperture Values

CAMERA (tape) [1.8], [2.0], [2.4], [2.8], [3.4], [4.0], [4.8], [5.6], [6.7], [8.0]

CAMERA (memory) [2.8], [3.4], [4.0], [4.8], [5.6], [6.7], [8.0]

SCN Special Scene: Recording Programs to Match Special Conditions

Recording in a very bright ski resort or capturing the full colors of a sunset or a fireworks display becomes as easy as selecting a special scene recording program.

POINTS TO CHECK

CAMERA (tape) CAMERA (memory) | PLAY (tape) PLAY (memory) (📖 10)

Mode switch: SCN



FUNC.
(📖 23)



FUNC. ⇨ Icon of the currently selected **Recording Program**

⇩

FUNC. ⇦ Desired option

NOTES

● Do not change the position of the mode switch while recording as the brightness of the image may change abruptly.

● [PORTRAIT]/[SPORTS]/[BEACH]/[SNOW]
- The picture may not appear smooth during playback.

● [PORTRAIT]
- The blur effect of the background increases the more you zoom in (**T**).

● [NIGHT]
- Moving subjects may leave a trailing afterimage.
- Picture quality may not be as good as in other modes.
- White points may appear on the screen.
- Autofocus may not work as well as in other modes. In such case, adjust the focus manually.

● [SNOW]/[BEACH]
- The subject may become overexposed on cloudy days or in shaded places. Check the image on the screen.

● [FIREWORKS]
- To avoid camcorder shake, we recommend using a tripod. Make sure to use a tripod especially in CAMERA (memory), as the shutter speed slows down.

Adjusting the Picture: Exposure, Focus and Color

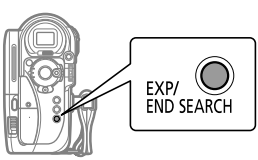
Manual Exposure Adjustment

At times, backlit subjects may appear too dark (underexposed) or subjects under very strong lights may appear too bright or glaring (overexposed). To correct this you can manually adjust the exposure.

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (10)

Mode switch: P, SCN (except for the [FIREWORKS] recording program).



1 Press EXP.
- The exposure adjustment indicator ⊶—I—⊶ and the neutral value "±0" appear on the screen.
- If you operate the zoom during exposure lock, the brightness of the image may change.

2 Adjust (▲▼) the brightness of the image as required.
- The adjustment range and the length of the exposure adjustment indicator will vary depending on the initial brightness of the picture.
- Pressing EXP again will return the camcorder to automatic exposure.

Light Metering Mode

The camcorder measures the light reflected from the subject in order to calculate the optimal exposure settings. Depending on the subject, you may want to change the way the light is measured and evaluated.

POINTS TO CHECK

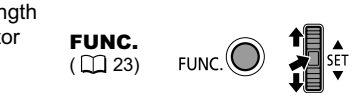
CAMERA CAMERA | PLAY PLAY (10)

Mode switch: P

Options ♦ Default value

[EVALUATIVE]♦
Appropriate for standard shooting conditions, including backlit scenes. The camcorder divides the picture into several areas and the light is measured in all of them to achieve the optimal exposure for the subject.
[CENT.WEIGHT.AVERAGE]
Averages the light metered from the entire screen, giving more weight to the subject in the center.
[SPOT]
Meters the area within the spot AE point frame. Use this setting to adjust the exposure to match the subject in the center of the screen.

FUNC. (23)



FUNC. ⇨ Icon of the currently selected **Light Metering Mode**

⇩

FUNC. ⇦ Desired option

Automatic Focus Modes

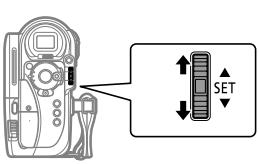
You can change the AF (autofocus) frame selection mode. When the mode switch is set to AUTO, 9 point AiAF is automatically selected.

CAMERA | CAMERA | PLAY | PLAY (📖 10)

Options

9 Point AiAF (Mode switch: P, AUTO, SCN)
Depending on the shooting conditions, one or more AF frames out of the nine frames available are automatically selected and the focus is fixed on them. Four framing corners will appear on the screen when making the selection; they do not appear while actually recording.
Center point (Mode switch: P, SCN*)
The focus is automatically fixed on the center AF frame. This is convenient for making sure the focus is exactly where you want it. A single focusing frame appears in the center of the screen when making the selection; it will appear also while actually recording.

* Except for the [FIREWORKS] recording program.



Select (▲▼) the autofocus mode.

Manual Focus Adjustment

Autofocus may not work well on the following subjects. In such case, focus manually.

Reflective surfaces



Subjects with low contrast or without vertical lines



Fast moving subjects



Through wet windows



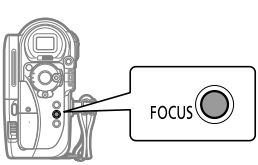
Night scenes



POINTS TO CHECK

CAMERA | CAMERA | PLAY | PLAY (📖 10)

Mode switch: P, SCN



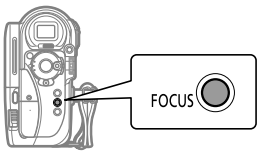
1 **Adjust the zoom.**
2 **Press** FOCUS**.**
"MF" appears.
3 **Adjust (▲▼) the focus as required until the image appears focused.**
Pressing FOCUS again will return the camcorder to autofocus.

NOTES

The camcorder will automatically return to autofocus when you set the mode switch to AUTO.

Infinity Focus

Use this function when you wish to focus on faraway subjects such as mountains or fireworks.



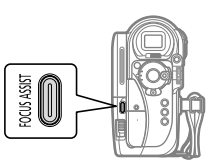
1 Adjust the zoom.

2 Keep [FOCUS] pressed down for more than 2 seconds.

- ∞ appears.
- Pressing [FOCUS] again will return the camcorder to autofocus.
- Operating the zoom or the [SET] dial (▲▼) will return the camcorder to manual focus adjustment.

Focus Assist Functions

The focus assist function will magnify the center of the picture and emphasize the outlines of the objects on screen (peaking) to make it easier for you to focus manually.



POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (📖 10)

Mode switch: P, SCN

1 Press [SET].
"MF" appears.

2 Press [FOCUS ASSIST].
The center of the picture will be magnified and the silhouettes will be emphasized.

3 Adjust (▲▼) the focus as required until the image appears focused.

NOTES

- You can also apply the peaking function (without the magnification) by setting [ASSIST FUNC.] to [PEAK PEAKING] (📖 36).
- Using the focus assist functions will not affect the recordings on the tape or memory card. When you start recording, the assist functions will be canceled and the display will return to normal.
- In CAMERA mode, you can also use the focus assist functions after pressing [PHOTO] halfway.
- The camcorder will automatically return to autofocus when you set the mode switch to AUTO.

White Balance

The white balance function helps you accurately reproduce colors under different lighting conditions so that white objects will always look truly white in your recordings.

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (📖 10)

Mode switch: P

Options ♦ Default value

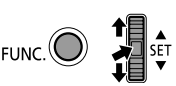
[AWB AUTO]♦
Settings are automatically set by the camcorder. Use this setting for outdoor scenes.
[☀ DAYLIGHT]
For recording outdoors on a bright day.

[SHADE]
For recording in shaded places.
[CLOUDY]
For recording on a cloudy day.
[TUNGSTEN]
For recording under tungsten and tungsten type (3-wavelength) fluorescent lighting.
[FLUORESCENT]
For recording under warm white, cool white or warm white type (3-wavelength) fluorescent lighting.
[FLUORESCENT H]
For recording under daylight or daylight type (3-wavelength) fluorescent lighting.
[SET]
Use the custom white balance for special situations not covered by the other options. The custom white balance will ensure that white subjects appear white under various lighting conditions.

NOTES

- When you select the custom white balance [SET]:
 - Make the white balance adjustment in a place with sufficient light.
 - Set [D.ZOOM] to [OFF] (📖 31).
 - Readjust the white balance if the lighting conditions change.
 - Very rarely and depending on the light source, may keep on flashing instead of staying on. Even in that case, the white balance would be properly adjusted and the results should be better than with [AUTO].
- Custom white balance may provide better results in the following cases:
 - Changing lighting conditions
 - Close-ups
 - Subjects in a single color (sky, sea or forest)
 - Under mercury lamps and certain types of fluorescent lights
- Depending on the type of fluorescent light, optimal color balance may not be obtained with [FLUORESCENT] or [FLUORESCENT H]. If the color looks unnatural, adjust it using [AUTO] or [SET].

FUNC. (📖 23)



FUNC. ⇨ Icon of the currently selected **White Balance**

⇩

FUNC. ⇦ Desired option*

* When you select [SET], do not press FUNC. and continue instead with the procedure below.

TO SET THE CUSTOM WHITE BALANCE

1. **Point the camcorder at a white object, zoom in until it fills the whole screen and press SET.**
 When the adjustment is completed stops flashing and stays on. The camcorder retains the custom setting even if you turn off the camcorder.
2. **Press FUNC. to save the setting and close the menu.**

Image Effects

You can use the image effects to change the color saturation and contrast to obtain different results.

POINTS TO CHECK

CAMERA CAMERA PLAY PLAY (📖 10)

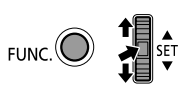
Mode switch: P

Options ♦ Default value

[IMAGE EFFECT OFF]♦
Records with no image enhancing effects.
[VIVID]
Emphasizes the contrast and color saturation.

[NEUTRAL]
Tones down the contrast and color saturation.
[LOW SHARPENING]
Records subjects with softened outlines.
[SOFT SKIN DETAIL]
Softens the details in the skin tone area for a more complimentary appearance.
[CUSTOM]
Allows you to adjust the brightness, contrast, sharpness, and color depth of the image. [BRIGHTN.]: (–) Darker picture, (+) Brighter picture [CONTRAST]: (–) Flatter picture, (+) More defined light and shade [SHARPNESS]: (–) Vaguer outlines, (+) Sharper outlines [COL.DEPTH]: (–) Shallower colors, (+) Richer color tonality

FUNC. (📖 23)



FUNC. ⇨ Icon of the currently selected **Image Effect**

⇩

FUNC. ⇦ Desired option*

* When you select [CUSTOM], do not press FUNC. and continue instead with the procedure below.

To set the custom image effect

1. **Select (▲▼) one of the custom setting options and press SET.**
2. **Adjust (▲▼) each setting as desired and then press SET.**
 Change other custom settings in the same way.
3. **Press FUNC. to save the setting and close the menu.**

Still Image Recording Options

Selecting the Size and Quality of Still Images

Still images are recorded on the memory card using the JPEG (Joint Photographic Experts Group) compression. As a general rule select a larger image size for higher quality.

CAMERA | CAMERA | PLAY | PLAY (📖 10)

Options

Approximate number of still images that can be recorded in different recording media with the following quality settings:
: [SUPER FINE], : [FINE], : [NORMAL]

On a 32 MB memory card

Image Size			
LW 1920x1080	20	30	60
L 2048x1536	10	20	40
M 1440x1080	25	40	80
S 640x480	140	205	375

On a 128 MB memory card

Image Size			
LW 1920x1080	90	135	265
L 2048x1536	60	85	180
M 1440x1080	120	180	350
S 640x480	600	865	1,560

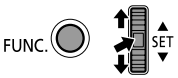
On a 512 MB memory card

Image Size			
LW 1920x1080	350	525	1,040
L 2048x1536	235	350	700
M 1440x1080	470	700	1,370
S 640x480	2,320	3,355	6,040

♦ Default value

L	2048x1536/FINE♦

FUNC. (📖 23)



FUNC. ⇨ Icon of the currently selected **Image Quality/Size**

⇩

Desired image size*

⇩ ⇧

Press SET

⇩ ⇧

FUNC. ⇦ Desired image quality*

* The number displayed on the right corner indicates the approximate number of images that can be recorded with the current quality/size setting.

NOTES

- Depending on the number of images on the memory card (Windows: more than 1,800 images; Macintosh: more than 1,000 images), you may not be able to download images to a computer. Try using a card reader.
- Connection to a PictBridge compatible printer will not work when the memory card contains more than 1,800 images. For best performance, we recommend to keep the number of images on the memory card under 100.

Capturing a Still Image while Recording Movies

While you are recording a movie on the tape you can simultaneously capture the same picture as a still image on the memory card without interrupting your recording to change modes. The size and quality of the still image can be selected.

POINTS TO CHECK

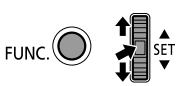
CAMERA | CAMERA | PLAY | PLAY (📖 10)

Select the size and quality of the still image in record pause mode before you start recording.

♦ Default value

OFF	STILL I.REC OFF♦

FUNC. (📖 23)



FUNC. ⇨ Icon of the currently selected **Still Image Simultaneous Recording** option

⇩

Desired image size*

⇩ ⇧

Press SET

⇩ ⇧

FUNC. ⇦ Desired image quality*

* The number displayed on the right corner indicates the approximate number of images that can be recorded with the current quality/size setting.

TO CAPTURE THE STILL IMAGE

While you are recording a movie, press PHOTO.

The still image is recorded on the memory card while the screen continues to show the video recording.

NOTES

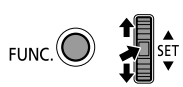
- The still image cannot be recorded on the memory card while using the digital zoom or while a digital effect is activated.
- To record still images we recommend using the CAMERA mode, which offers the best quality for still images.

Capturing a Still Image from the Playback Picture

While you are playing back a tape you can capture the picture as a still image on the memory card. The size of the still image cannot be changed and depends on the standard of the recording on the tape, but the quality can be selected.

CAMERA | CAMERA | **PLAY** | PLAY (10)

FUNC. (23)



FUNC. ⇨ Icon of the currently selected **Still Image Capturing** option

⇩

FUNC. ⇦ Desired image quality

TO CAPTURE THE STILL IMAGE

During playback or in playback pause mode, press PHOTO.

NOTES

The data code of the captured still image will reflect the date and time when it was recorded on the memory card.

Continuous Shooting and Exposure Bracketing

Catch every instant of a child running or other moving object with continuous shooting or use the exposure bracketing to record the same picture in 3 levels of exposure in order to choose the picture you like best.

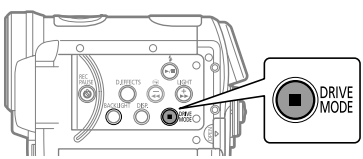
POINTS TO CHECK

CAMERA | **CAMERA** | PLAY | PLAY (10)

Mode switch: P, SCN (except for the [FIREWORKS] recording program).

Options ♦ Default value

[□ SINGLE]♦
Records a single still image.
[CONT.SHOOT.](Continuous Shooting) [HISPEED CONT.SHOOT.](High-Speed Continuous Shooting)
Captures a series of still images as long as you hold PHOTO pressed down. For the number of frames per second, refer to the table below.
[AEB] (Auto Exposure Bracketing)
The camcorder records a still image in three different exposures (dark, normal, light in 1/2 EV steps), allowing you to choose the shot you like the best.



1 **Press DRIVE MODE repeatedly to cycle between the drive modes.**
2 **Press PHOTO halfway to activate the autofocus.**

CONTINUOUS SHOOTING/ HIGH-SPEED CONTINUOUS SHOOTING

3 Press PHOTO fully and hold it pressed down.
A series of still images will be recorded as long as you hold the button pressed down.

AUTO EXPOSURE BRACKETING

3 Press PHOTO fully.
Three still images in different exposures will be recorded on the memory card.

NOTES

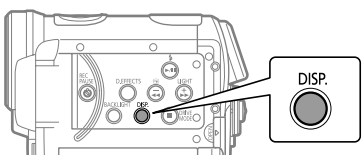
- The speed and maximum number of continuous shots is as follows.
 - [CONT.SHOOT.]: Approx. 3 images/second
 - [HISPEED CONT.SHOOT.]: Approx. 5 images/second
 - Continuous Shooting with flash: Approx. 2.1 images/second
 - Maximum Number of Shots: 60 still images
- These figures are approximate and vary with the recording conditions and subjects.
- The actual number of images per second will be lower when " " (camcorder shake warning) is displayed on the screen.

Other Functions

On-Screen Displays

The camcorder keeps a data code containing the date and time and other camera data (shutter speed, exposure, etc.) registered at the time of recording. You can select the data to be displayed.

Turning the On-Screen Displays On/Off



Repeatedly press DISP. to turn the on-screen displays on/off in the following sequence.

CAMERA·, CAMERA·
All displays on → All displays off

PLAY·
On-screen displays + Data code[1] on → Only on-screen displays on → Only tape-related displays[2] (in stop mode or playback pause) or All displays off (during playback)

PLAY·
On-screen displays + Histogram[3]/Data code on → Only on-screen displays on → All displays off

[1] Data code: Time, date and camera data at the time of recording. The contents to be displayed can be selected as explained in the following section.
[2] Tape related displays: Tape operation icon, time code and remaining tape display.
[3] Histogram display: For still images you can display the complete camera data registered at the time of recording. For details on how to read the histogram display, refer to the following section.

Selecting the Data Code

You can select the data code to be displayed when playing back movies.

CAMERA | CAMERA | **PLAY** | PLAY

Options ♦ Default value

[DATE], [TIME]
Displays the date or time when the scene or still image was recorded.
[DATE & TIME]♦
Displays both the date and time of the recording.
[CAMERA DATA]
Displays the exposure (f-stop) and shutter speed used when recording the image.
[CAM.& D/T]
Displays the exposure, shutter speed, date and time of the recording.

MENU (📖 22) MENU SET

MENU ⇨ DISPLAY SETUP/

⇩

DATA CODE

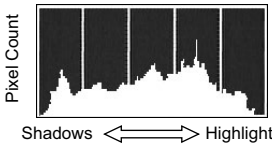
⇩

MENU ⇦ Desired option

Reading the Histogram Display

When viewing still images you can display the histogram display and the icons of all the functions used at the time of recording. Use the histogram as a reference to verify the correct exposure of the still image.

The area to the right of the histogram represents highlights and the left side represents shadows. A still image whose histogram skews to the right is relatively bright; while one whose histogram peaks to the left, is relatively dark.



NOTES

If you turn all displays on with DISP., the histogram display will appear also after recording a still image while reviewing it within the time set for the [REVIEW] option (or immediately after recording it, if [REVIEW] is set to [OFF OFF]).

Flash

You can use the built-in flash for recording still images in dark places. The flash is equipped with the red-eye reduction function.

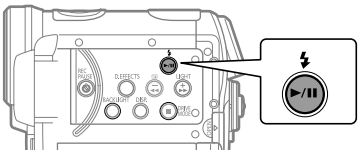
POINTS TO CHECK

CAMERA | **CAMERA** | PLAY | PLAY (📖 10)

Select a recording program other than [FIREWORKS] (SCN).

Options ♦ Default value

(auto)♦
The flash fires automatically according to the brightness of the subject.
(red-eye reduction, auto)
The assist lamp lights up to reduce the red-eye effect. The flash fires automatically according to the brightness of the subject.
(flash on)
The flash always fires.
(flash off)
The flash does not fire.



1 Press [⚡] (flash button).
- Repeatedly pressing [⚡] will cycle between the flash modes.
- The icon of the selected flash mode will appear (⚡A disappears after 4 seconds).

2 Press [PHOTO], first halfway to activate the autofocus and then fully to record the still image.

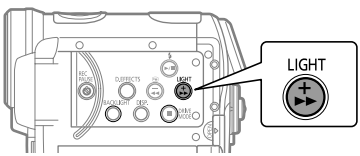
NOTES

- The practical range of the flash is approx. 1 to 2 m (3.3 to 6.6 ft.). The range depends on the recording conditions.
- The range of the flash decreases in continuous shooting mode.
- For the red-eye reduction to be effective, the subject needs to look at the assist lamp. The degree of reduction depends on the distance and on each individual.
- The flash will not fire in the following cases:
 - When you manually adjust the exposure in ⚡A (auto) or 👁 (red-eye reduction) mode.
 - During auto exposure bracketing.
- The flash mode cannot be changed after you pressed [EXP] to manually adjust the exposure.
- We recommend not using the flash when the optional Wide-converter or Tele-converter is attached. Their shadows appear on the screen.
- **About the AF-Assist Lamp:** While you press [PHOTO] halfway, if the subject is too dark the assist lamp may light up briefly in order to enable the camcorder to focus more accurately (AF-assist lamp). You can also set [AF AST LAMP] to [OFF OFF] so the assist lamp does not light up.
 - The camcorder may not be able to focus even if the AF-assist lamp is on.
 - The brightness of the AF-assist lamp could be an inconvenience. Consider turning it off in public places such as restaurants or theaters.

Mini Video Light

You can turn on the mini video light (assist lamp) at any time regardless of the recording program.

CAMERA CAMERA | PLAY PLAY (📖 10)



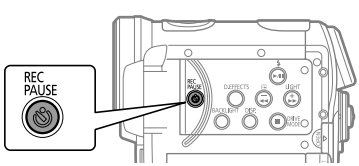
Press [LIGHT].
- ☼ appears on the screen.
- Press [LIGHT] again to turn the mini video light off.

Self Timer

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (📖 10)

CAMERA·▶ : Set the camcorder in record pause mode.



1 Press [⏲].
- ⏲ appears.
- Press [⏲] again to cancel the self timer.

CAMERA·📼:

2 Press [Start/Stop].
The camcorder starts recording after a 10-second countdown (2 seconds when using the wireless controller). The countdown appears on the screen.

CAMERA·📷:

2 Press PHOTO, first halfway to activate the autofocus and then fully to record the still image.
The camcorder will record the still image after a 10-second countdown (2 seconds when using the wireless controller). The countdown appears on the screen.

NOTES

Once the countdown has begun, you can also press Start/Stop (when recording movies) or press PHOTO fully (when recording still images) to cancel the self timer. The self timer will also be canceled if you turn off the camcorder.

Digital Effects

[FADER] Faders

Begin or end scenes with a fade to or from black. You can preview the effect on the display.

F1 [FADE-T] (fade trigger)	**F2 [WIPE]**

[EFFECT] Effects

Add flavor to your recordings. Sound will be recorded normally. You can preview the effect on the display.

E1 [BLK&WHT] (black and white)	**E2 [SEPIA]**
E3 [ART]	

POINTS TO CHECK

CAMERA 🎞 | CAMERA 📷 | PLAY 🎞 | PLAY 📷 (📖 10)

Mode switch: P, SCN

CAMERA·📷: [E1 BLK&WHT] only.

♦ Default value

D.EFF OFF	D.EFFECT OFF♦

FUNC. (📖 23)

FUNC. → SET

Setting

FUNC. ⇨ Icon of the currently selected **Digital Effect**

⇩

FADER

or

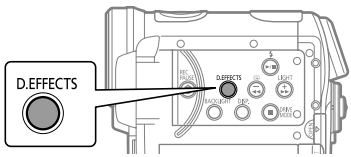
EFFECT

⇩

FUNC.** ⇦ Desired fader/effect.*

* You can preview the effect on the screen before pressing SET.
** The icon of the selected effect appears.

Applying



1 Press D.EFFECTS to activate the fader/effect.
- The icon of the selected effect turns green.
- Press D.EFFECTS again to deactivate the fader/effect.

TO FADE IN

Press D.EFFECTS ...

CAMERA·🎞: ...in record pause mode, then press Start/Stop to start recording with a fade in.

PLAY·🎞: ...in playback pause mode, then press ▶/II to fade in and start the playback.

To Fade Out

Press [D.EFFECTS] **...**

CAMERA·: ...while recording, then press [Start/Stop] to fade out and pause the recording.

PLAY·: ...during playback, then press [▶/II] to fade out and pause the playback.

To Activate an Effect

Press [D.EFFECTS] **...**

CAMERA·: ...while recording or in record pause mode.

PLAY·: ...during playback.

CAMERA·: ...and then press [PHOTO] to record the still image in black and white.

NOTES

- When you are not using the digital effect, select [D.EFFECT OFF].
- The camcorder retains the setting last used even if you turn off the digital effects or change the recording program.

Still Image Options

Erasing Still Images

IMPORTANT

Be careful when erasing images. Erased images cannot be recovered.

NOTES

Protected images cannot be erased.

Erasing a Single Image

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

FUNC. (📖 23) FUNC. SET

FUNC. ⇨ IMAGE ERASE

⇩

FUNC. ⇦ ERASE

Erasing a Single Image Just After Recording

CAMERA | **CAMERA** | PLAY | PLAY (📖 10)

You can erase the last recorded still image while reviewing it within the time set for the [REVIEW] option (or immediately after recording it, if [REVIEW] is set to [OFF OFF]).

FUNC. (📖 23) FUNC. SET

While reviewing the image immediately after recording:

FUNC. ⇨ IMAGE ERASE

⇩

FUNC. ⇦ ERASE

Erasing All Images

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

MENU (📖 22) MENU SET

MENU ⇨ CARD OPERATIONS

⇩

ERASE ALL IMAGES

⇩

MENU ⇦ YES

Protecting Still Images

You can protect still images from accidental erasure.

IMPORTANT

Initializing the memory card (📖 56) will permanently erase all recorded still images, even the protected ones.

Protecting a Single Image

CAMERA | PLAY | PLAY | **PLAY** (📖 10)

FUNC. (📖 23) FUNC. SET

FUNC. ⇨ PROTECT

⇩

FUNC. ⇦ PROTECT ON*

appears and the image cannot be erased.

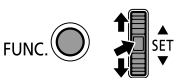
* To cancel the image protection, select [PROTECT OFF] instead.

Protecting a Single Image Just After Recording

CAMERA | **CAMERA** | PLAY | PLAY

You can protect the last recorded still image while reviewing it within the time set for the [REVIEW] option (or immediately after recording it, if [REVIEW] is set to [OFF OFF]).

FUNC. (📖 23)



FUNC. ⇨ PROTECT
⇩
FUNC. ⇦ PROTECT ON*

🔑 appears and the image cannot be erased.

* To cancel the image protection, select [PROTECT OFF] instead.

Protecting Still Images from the Index Screen

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

Move the zoom lever toward **W** to enter the still image index screen.

MENU (📖 22)



MENU ⇨ CARD OPERATIONS
⇩
➡ PROTECT
⇩
MENU ** ⇦ Bring (▲▼) the cursor ☞ to the image you want to protect and press SET .*
Repeat this step to protect additional images.

* 🔑 appears on protected images. Press SET to cancel the protection.
**After closing the menu the camcorder returns to the index screen.

Initializing the Memory Card

Initialize new memory cards when you use them for the first time. You may also have to initialize a card if you get the “CARD ERROR” message or you may choose to do so to erase all data recorded on it.

IMPORTANT

- Initializing the memory card will erase all still images, even the protected ones. The original still images cannot be recovered.
- Initialize all memory cards before using them with this camcorder.

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

MENU (📖 22)



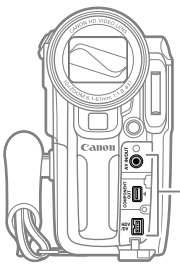
MENU ⇨ CARD OPERATIONS
⇩
INITIALIZE
⇩
YES
⇩
MENU ⇦ YES

Connecting to a TV or VCR

E

Connection Diagrams

Turn off all the devices when making the connections and refer also to the instruction manual of the connected device.



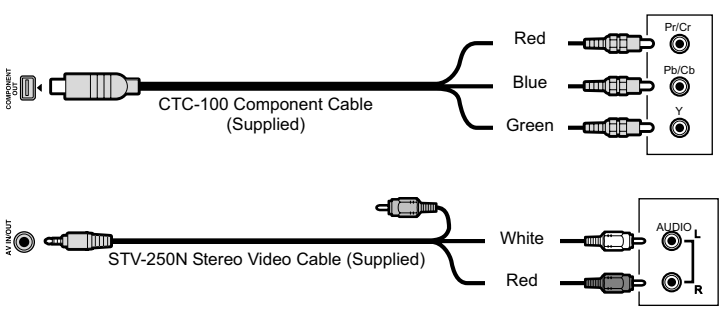
Open the terminal cover to access.

AV IN/OUT	**AV IN/OUT Terminal**
COMPONENT OUT	**COMPONENT OUT Terminal** The component video terminal is for video only. When you use connection type **1** do not forget the audio connections using the AV IN/OUT terminal.
HDV /DV	**HDV/DV Terminal** Check the type and orientation of the terminal and make sure you connect the DV cable properly.

High Definition TV Sets (HDTV)

Terminal on the Camcorder	Connecting Cable	Terminal on the Connected Device

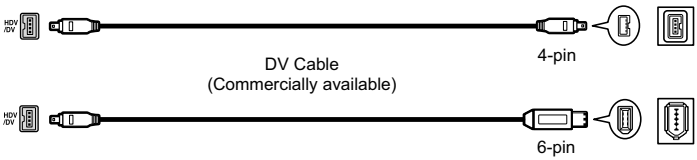
1 Output connection (Signal Flow ➡) to an HDTV with component video input terminals.



High Definition TV Sets (HDTV) Cont.

Terminal on the Camcorder	Connecting Cable	Terminal on the Connected Device

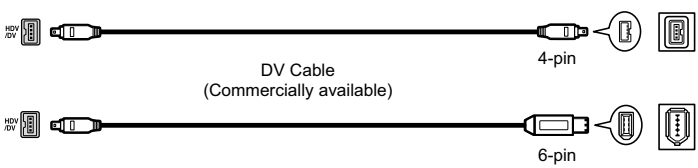
2 Output connection (Signal Flow ➡) to an HDTV with a DV (IEEE1394) terminal.
Input connection (Signal Flow ⬅) from a TV or other digital video source with a DV (IEEE1394) output.



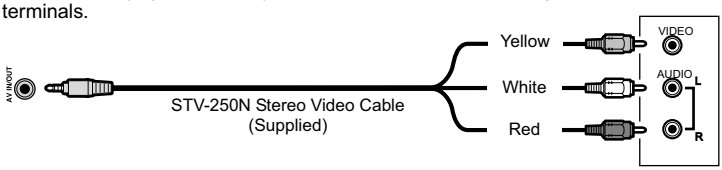
Standard Definition TV Sets

Terminal on the Camcorder	Connecting Cable	Terminal on the Connected Device

2 Output connection (Signal Flow ➡) to an HDTV with a DV (IEEE1394) terminal.
Input connection (Signal Flow ⬅) from a TV or other digital video source with a DV (IEEE1394) output.



3 Output connection (Signal Flow ➡) to a TV or VCR with AV Terminals.
Input connection (Signal Flow ⬅) from a TV, VCR or other analog video source with AV terminals.



Playback on a TV Screen

The quality of the playback picture will vary depending on the connected TV and the type of connection used.

CAMERA CAMERA | PLAY PLAY (📖 10)

Change the following settings as necessary before making the connections. Refer to the corresponding explanation of each setting in the *PLAY/OUT SETUP* menu option list (📖 34).

- [PLAYBACK STD] to select the output video standard.
- [TV TYPE] to match the output video to the aspect ratio of the connected TV.
- [COMP.OUT] to select the video specifications when using connection type **1**.
- [DV OUTPUT] to select the standard of the output video when using connection type **2**.

Connecting

1 Connect the camcorder to the TV following one of the connection diagrams shown in the previous section *Connection Diagrams* (📖 57).

Playback

1 Turn on the camcorder and the connected TV or VCR.
On a TV: Set the input selector to VIDEO. On a VCR: Set the input selector to LINE (IN).

2 Start the playback of the movies (📖 27) or still images (📖 29).

NOTES

- Turn off all the devices before starting the connections.
- We recommend powering the camcorder using the compact power adapter.
- If you connect to a TV using the video component connection –connection type **1** (📖 57)– you can enjoy the full resolution of high definition TV.

Recording to a VCR or Digital Video Recorder

You can copy your recordings by connecting the camcorder to a VCR or a digital video device. When recording to a digital video recorder using the HDV/DV terminal, you can copy recordings with virtually no generation loss in video and sound quality.

Connect the camcorder to the external device following one of the connection diagrams shown in the previous section *Connection Diagrams* (📖 57).

POINTS TO CHECK

CAMERA CAMERA | PLAY PLAY (📖 10)

Change the following settings as necessary before making the connections. Refer to the corresponding explanation of each setting in the *PLAY/OUT SETUP* menu option list (📖 34).

- [PLAYBACK STD] to select the output video standard.
- [DV OUTPUT] to select the standard of the output video when using connection type **2**. Note that the video standard of the recorded copy depends also on the standards supported by the external digital device. Refer to the table below.

Connecting

Connect the camcorder to a VCR or other analog device using connection type **3**, or to a DVD recorder or other digital recording device using connection type **2**, as shown in the previous section *Connection Diagrams* (📖 57).

Recording

1. **This camcorder: Load the recorded cassette.**
2. **Connected device: Load a blank cassette or disc and set the device to record pause mode.**
3. **This camcorder: Locate the scene you wish to copy and pause the playback shortly before the scene.**
4. **This camcorder: Resume the movie playback.**
 • When the connection is recognized "HDV/DV" will be displayed. When the video output starts the display will change to "HDV-OUT" or "DV-OUT" depending on the original recording and the settings selected.
 • When using an analog connection you can include in the copy also the date, time and data code of the original recording. Repeatedly press DISP. to change the on-screen display (📖 50).
5. **Connected device: Begin recording when the scene you wish to copy appears. Stop recording when copying is complete.**

Settings for Recording Video Output using the HDV/DV Terminal

Standard of the Recorded Copy	Original Standard of the Recording	Supported Standard of the External Digital Device	[PLAYBACK STD] Setting	[DV OUTPUT] Setting
HDV	HDV	HDV	[A AUTO] or [HDV HDV]	[HDV/DV HDV/DV]
DV	HDV	DV	[A AUTO] or [HDV HDV]	[DV DV LOCKED]
	DV	DV	[A AUTO] or [DV DV]	[HDV/DV HDV/DV] or [DV DV LOCKED]

6 This camcorder: Stop playback.

NOTES

- We recommend powering the camcorder using the compact power adapter.
- When recording to a VCR using an analog connection –connection type 3 (📖 57)–, the quality of the edited tape will be lower than the original.
- When recording to a digital video recorder using the HDV/DV terminal –connection type 2 (📖 57)–:

- If the picture does not appear, disconnect the DV cable and restore the connection after a short while or turn the camcorder off and then on again.
- Proper operation cannot be guaranteed for all digital devices equipped with a DV terminal. If the operation does not work, use the AV IN/OUT terminal.

Analog Line-In Recording

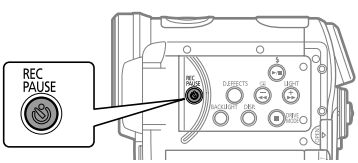
You can input video from an analog video source (VCR, TV, etc.) and record the input video on the tape in the camcorder in DV standard. Analog video cannot be converted to HDV standard.

CAMERA | CAMERA | PLAY | PLAY (📖 10)

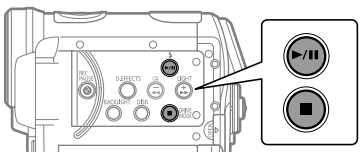
Connecting

Connect the camcorder to the video input source using an analog connection – connection type 3 (📖 57)– shown in the previous section *Connection Diagrams*.

Recording



1 Load a blank tape in this camcorder.
2 Connected device: Load the recorded cassette or disc.
3 Press REC PAUSE.
4 Connected device: Start the playback.
In record pause mode and while recording you can check the picture on the camcorder's screen.



5 When the scene you wish to record appears, press ▶/II.
Recording starts.
6 While recording, press ▶/II to pause the recording.
In record pause, press ▶/II again to resume recording.
7 Press ■ to stop recording.
8 Connected device: Stop the playback.

IMPORTANT

Depending on the analog signal sent from the connected device the input image may be distorted or not be displayed at all (for example, video input that includes copyright protection signals or anomalous signals such as ghost signals).

NOTES

We recommend powering the camcorder using the compact power adapter.

Digital Video Dubbing

You can input video from other digital video devices and record the input video on the tape in the camcorder. Video input will be recorded on the tape in the same standard of the original (HDV or DV).

POINTS TO CHECK

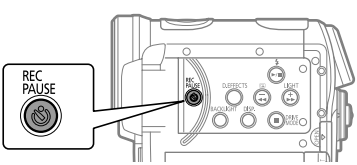
CAMERA | CAMERA | PLAY | PLAY (10)

Set [PLAYBACK STD] to [A AUTO] (34) before making the connections.

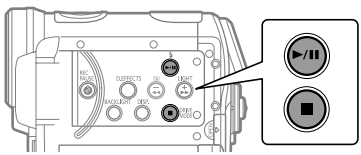
Connecting

Connect the camcorder to the video input source using the digital connection –connection type 2 (57)– shown in the previous section *Connection Diagrams*.

Dubbing



1. **Load a blank cassette in this camcorder.**
 If "AV➡DV" is displayed, set [AV➡DV] to [OFF OFF] (33).
2. **Connected device: Load the recorded cassette.**
3. **Press** REC PAUSE.
4. **Connected device: Start the playback.**
 • In record pause mode and while recording you can check the picture on the camcorder's screen.
 • When the connection is recognized "HDV/DV" will be displayed. When the video input starts the display will change to "HDV-IN" or "DV-IN" depending on the video input.



5. **When the scene you wish to record appears, press ▶/II.**
 Recording starts.
6. **While recording, press ▶/II to pause the recording.**
 In record pause, press ▶/II again to resume recording.
7. **Press ■ to stop recording.**
8. **Connected device: Stop the playback.**

IMPORTANT

- Blank sections may be recorded as anomalous picture.
- If the picture does not appear, disconnect the DV cable and restore the connection after a short while or turn the camcorder off and then on again.
- Do not connect any devices to the camcorder's USB terminal while an external device is connected to the HDV/DV terminal.
- You can only record video signals in HDV standard (1080i specifications) or in DV standard. Note that signals from identically shaped DV (IEEE1394) terminals may be in different video standards.

NOTES

We recommend powering the camcorder using the compact power adapter.

Copyright Signal

Certain software tapes are copyright protected. If you attempt to play back such tape, "COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED" appears and you will not be able to view the contents of the tape. If you attempt to record from such tape via the HDV/DV terminal, "COPYRIGHT PROTECTED DUBBING

RESTRICTED" appears and you will not be able to record the contents of the tape.

Analog/Digital Conversion

Using the camcorder you can convert analog video signals (for example from a VCR) to digital signals (DV standard only) and output them to a digital recording device.

Connecting

Connect the camcorder to the video input source using an analog connection –connection type 3 (📖 57)– shown in the previous section *Connection Diagrams*.

Connect the camcorder to the recording device using the digital connection –connection type 2 (📖 57)– shown in the same section.

Converting the Video

MENU (📖 22) 

1 Set [AV➡ DV] to [ON] (📖 33).

2 Start the playback on the video source and the recording on the recording device.
Refer to the instruction manuals of the connected devices.

IMPORTANT

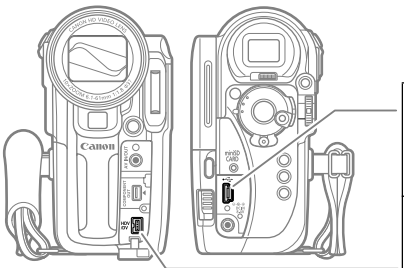
- Depending on the signal sent from the connected device, the conversion from analog to digital signals might not work properly (e.g., signals that include copyright protective signals or anomalous signals such as ghost signals).
- Usually, leave [AV➡ DV] set to the default setting [OFF]. While it is set to [ON] you cannot connect video input signals to the camcorder using the HDV/DV terminal.

NOTES

- We recommend powering the camcorder using the compact power adapter.
- You can also use the analog/digital conversion to transfer analog video recordings to a computer as digital video. The required equipment and operation is the same as described in *Transferring Video Recordings* (📖 65) except in this case you need to set [AV➡ DV] to [ON] before connecting the camcorder to the computer. Note that the analog/digital conversion may not work correctly depending on the software and the specifications/settings of the computer.

Connecting to a Computer

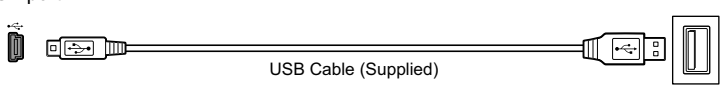
PC Connection Diagrams



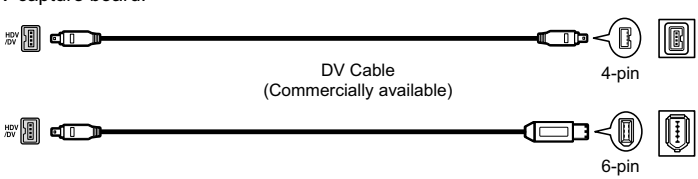
	**USB Terminal** Open the rear terminal cover to access.
	**HDV/DV Terminal** Check the type and orientation of the terminal and make sure you connect the DV cable properly.

Terminal on the Camcorder	Connecting Cable	Terminal on the Connected Device

1 Output connection (Signal Flow ➡) to a PC or PictBridge compatible printer with an USB port.



2 Output connection (Signal Flow ➡) to a computer with a DV (IEEE1394) terminal or a DV capture board.



E

Transferring Video Recordings

You can transfer recordings to a computer using the HDV/DV terminal.

Equipment and System Requirements

- A computer equipped with an IEEE1394 (DV) terminal or an IEEE1394 (DV) capturing board.
- A DV cable (commercially available).
- Video Editing Software.
- The appropriate driver

The standard of the video transferred depends on the standard of the original recording and the compatibility of the video editing software.
When transferring a video originally recorded in HDV standard, if the editing software supports high definition video, the video transferred will be in HDV standard too. If the editing software does not support high definition video, even if the original recording was made in HDV standard, the video transferred will be in DV standard.

POINTS TO CHECK

Change the following settings as necessary before making the connections. Refer to the corresponding explanation of each setting in the *PLAY/OUT SETUP* menu option list (📖 34).
- [PLAYBACK STD] and [DV OUTPUT] to select the standard of the output video. Note that the video standard of the transferred video depends also on the standards supported by the editing software.
- [AV➡ DV] to select whether to transfer recordings from the tape in the camcorder (set to [OFF OFF]) or video converted from an external analog source (set to [ON ON]).

Connecting

1 Start the computer.

2 Set the camcorder to PLAY mode.

3 Connect the camcorder to the computer using the digital connection –connection type 2 (📖 64)– shown in the previous section *PC Connection Diagrams*.
When the connection is recognized "HDV/DV" will be displayed. When the video output starts the display will change to "HDV-OUT" or "DV-OUT" depending on the original recording and the settings selected.

4 Start the video editing software.
Refer to the instruction manual of the editing software.

IMPORTANT

- The video transfer may not work correctly depending on the software and the specifications/settings of your computer.
- If the computer freezes while the camcorder is connected to it, disconnect the DV cable and turn off the camcorder and the computer. After a short while, turn them on again, set the camcorder to PLAY mode and restore the connection.
- Before connecting the camcorder to the computer using a DV cable, make sure that the camcorder and computer are not connected with a USB cable, and that no other IEEE1394 device is connected to the computer.
- Depending on the video editing software, you may need to set the POWER switch of the camcorder to a mode other than PLAY. Refer to the instruction manual of the editing software.

NOTES

- We recommend powering the camcorder using the compact power adapter.
- Refer also to the instruction manual of the computer.
- The programs ZoomBrowser EX and Image Browser included with the supplied CD-ROM can only be used to transfer still images recorded on the memory card. Video recordings on the tape cannot be transferred to the computer using the software included with the supplied CD-ROM.

Transferring Still Images – Direct Transfer

With the supplied USB cable and Digital Video Software, you can transfer still images to a computer simply by pressing [print/share] (print/share).

Preparations

The first time you connect the camcorder to the computer, you need to install the software and set the auto-launch setting. From the second time on, you will only need to connect the camcorder to the computer to transfer images.

1. **Install the supplied Digital Video Software.**
 See *Installing the Digital Video Software* in the *Digital Video Software* instruction manual (electronic version on PDF file).
2. **Set the camcorder to [PLAY·] mode.**
3. **Connect the camcorder to the computer using the USB connection –connection type 1 (📖 64)– shown in the previous section *PC Connection Diagrams*.**
 See *Connecting the Camcorder to a Computer* in the *Digital Video Software* instruction manual (electronic version on PDF file).
4. **Set the auto-launch setting.**
 • See *Starting CameraWindow* (Windows) or *Auto-downloading* (Macintosh) in the *Digital Video Software* instruction manual (electronic version on PDF file).
 • The direct transfer menu appears on the camcorder screen and the [print/share] button lights up.

IMPORTANT

● When the CARD access indicator is on or flashing do not perform the following actions. Doing so may result in permanent data loss.
- Do not open the memory card slot cover and do not remove the memory card.
- Do not disconnect the USB cable.
- Do not turn off the camcorder or the computer.
- Do not change the position of the [tape/card] switch or the operating mode.

● Operation may not work correctly depending on the software and the specifications/settings of your computer.
● The image files on your memory card are valuable, original data files. If you wish to use the image files on your computer, make copies of them first, and use the copied file, retaining the original.

NOTES

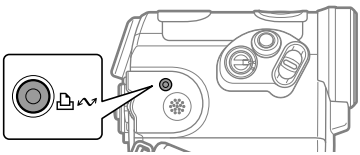
● We recommend powering the camcorder using the compact power adapter.
● Refer also to the computer's instruction manual.
● Users of Windows XP and Mac OS X:
Your camcorder is equipped with the standard Picture Transfer Protocol (PTP) allowing you to download still images (JPEG only) simply by connecting the camcorder to a computer using the USB cable without installing the software from the DIGITAL VIDEO SOLUTION DISK.

Transferring Images

[ALL IMAGES...]
Transfers all images to the computer.
[NEW IMAGES...]
Transfers only those images that have not yet been transferred to the computer.
[TRANSFER ORDERS...]
Transfers images with transfer orders (📖 67) to the computer.
[SELECT & TRANSFER...]
Allows you to select the still image you want to transfer to the computer.

[WALLPAPER...]

Allows you to select the still image you want to transfer and set it as your computer's desktop background.





1 Select (▲▼) a transfer option.

2 Press [SET].

[ALL IMAGES], [NEW IMAGES], [TRANSFER ORDERS]:

- The images are transferred and displayed on the computer.
- The camcorder returns to the transfer menu once the transfer is complete.
- To cancel the transfer, press [SET].

IF YOU SELECT [SELECT & TRANSFER] OR [WALLPAPER]

3 Press [SET].

4 Press [+] or [–] to select the image you wish to transfer and press [SET] to transfer it.

- [SELECT & TRANSFER]: The selected image is transferred and displayed on the computer. To continue transferring, select another image.
- [WALLPAPER]: The selected image is transferred to the computer and displayed as the desktop's background.
- The [SET] button will flash while the images are being transferred.
- Press [MENU] to return to the transfer menu.

NOTES

- You can press [SET] to transfer the images, instead of [SET]. With [ALL IMAGES], [NEW IMAGES] or [TRANSFER ORDERS], a confirmation message appears. Select [OK] and press [SET].
- When the camcorder is connected to the computer and the image selection screen is displayed, press [MENU] to return to the transfer menu.

Transfer Orders

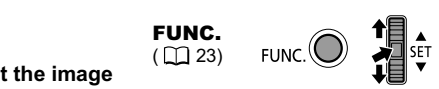
You can mark the still images you want to transfer to the computer as a transfer order. You can set transfer orders for up to 998 still images.

Selecting Still Images to Transfer (Transfer Order)

Do not connect the USB cable to the camcorder while setting the transfer orders.

[CAMERA] [CAMERA] | [PLAY] [PLAY] (📖 10)

FUNC. (📖 23)



[FUNC.] ⇨ TRANSFER ORDER

⇩

[FUNC.] ⇦ TRANS.ORDER ON*

* To cancel a transfer order, select [TRANS. ORDER OFF] instead.

Setting Transfer Orders from the Index Screen

[CAMERA] [CAMERA] | [PLAY] [PLAY] (📖 10)

Move the zoom lever toward **W** to enter the still image index screen.

MENU (📖 22)



MENU ⇨ CARD OPERATIONS

⇩

➡ TRANSFER ORDER

⇩

Bring (▲▼) the cursor ☞ to the image you want to transfer and press SET .*

MENU ** ⇦ Repeat this step to set transfer orders for additional images.

* 🖃 appears on images marked with a transfer order. Press SET to cancel the transfer order.

**After closing the menu the camcorder returns to the index screen.

Erasing All Transfer Orders

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

MENU (📖 22)



MENU ⇨ CARD OPERATIONS

⇩

TRANS.ORD.ALL ERASE

⇩

MENU ⇦ YES

Connecting to a Printer

Printing Still Images – Direct Print

PictBridge

The camcorder can be connected to any PictBridge compatible printer. You can mark the still images you want to print and set the desired number of copies as a print order (📖 71).

Canon printers: SELPHY CP and SELPHY DS printers and PIXMA printers marked with the PictBridge logo.

Connecting the Camcorder to the Printer

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

1. **Insert the memory card containing the still images you want to print.**
2. **Turn on the printer.**
3. **Connect the camcorder to the printer using the USB connection –connection type 1 (📖 64)– shown in the previous section *PC Connection Diagrams*.**
 - 🔌 appears and changes to 🖨.
 - The 🖨 (print/share) button lights up and the current print settings will be displayed for approx. 6 seconds.

IMPORTANT

If 🔌 continues to flash (for more than 1 minute) or if 🖨 does not appear, the camcorder is not correctly connected to the printer. In such case, disconnect the USB cable and turn off the camcorder and the printer. After a short while, turn them on again, set the camcorder to PLAY·🖃 mode and restore the connection.

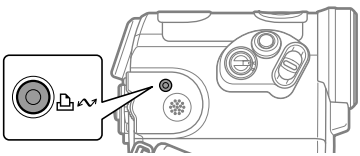
NOTES

- 🚫 will appear for images that cannot be printed.

● We recommend powering the camcorder using the compact power adapter.
● Refer also to the printer's instruction manual.

Printing with the (Print/Share) Button

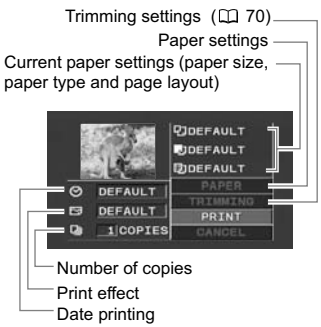
You can print a still image without changing the settings simply by pressing (print/share).



1 Press + or − to select the image you wish to print.
2 Press (print/share).
• Printing starts. The button flashes and stays on when the printing is completed.
• To continue printing, select another still image.

Selecting the Print Settings

You can select the number of copies and other settings for printing. The setting options vary depending on your printer model.



Options

[PAPER]
[PAPER SIZE] Available paper sizes vary depending on the printer model. [PAPER TYPE] Select [PHOTO], [FAST PHOTO] or [DEFAULT]. [PAGE LAYOUT] Select [DEFAULT] or one of the following available page layouts. [BORDERED]: Prints the whole image area almost exactly as the recorded still image. [BORDERLESS]: Enlarges the center portion of the still image to fit the width/height ratio of the selected paper size. The top, bottom and sides of the still image may be slightly trimmed out. [2-UP], [4-UP], [8-UP], [9-UP], [16-UP]: Prints multiple small copies of the same still image on one sheet of paper.
[Date print]
Select [ON], [OFF] or [DEFAULT].
[Print Effect]
The print effect can be used with printers compatible with the Image Optimize function to achieve higher quality prints. Select [ON], [OFF] or [DEFAULT]. **Canon PIXMA/SELPHY DS printers:** You can also select [VIVID], [NR] and [VIVID+NR].
[Number of Copies]
Select 1-99 copies.

NOTES

● Print setting options and [DEFAULT] settings vary depending on the printer model. For details, refer to the printer's instruction manual.
● **Canon PIXMA/SELPHY DS Printers:**
- When the paper size is set to [10 x 14.8 cm] you can print multiple small copies on a single

print by selecting 2-, 4-, 9- or [16-UP]. You can also use this setting to print on the specially designed photo stickers sheets.
- When the paper size is set to [A4] you can print 4 copies on the same sheet by selecting [4-UP].

● **Canon PIXMA/SELPHY CP Printers:**
- When the paper size is set to [CREDITCARD] you can print multiple small copies on a single print by selecting 2-, 4-, or [8-UP]. You can also use [8-UP] to print on the specially designed photo stickers sheets.
- When the paper size is set to [10 x 14.8 cm] or [9 x 13 cm] you can print 2 or 4 copies on the same sheet by selecting [2-UP] or [4-UP].
- When you are using the specially designed wide-sized photo paper you can set the paper size to [DEFAULT] and print 2 or 4 copies on the same sheet by selecting [2-UP] or [4-UP].

Printing after Changing the Print Settings

1 Press [SET].
- The print setting menu appears.
- Depending on the printer, the message "BUSY." may appear before the camcorder displays the print setting menu.

2 In the print settings menu, select (▲▼) the setting you want to change and press [SET].

3 Select (▲▼) the desired setting option and press [SET].

4 Select (▲▼) [PRINT] and press [SET].
- Printing starts. The print setting menu disappears when the printing is completed.
- To continue printing, select another still image.

To cancel the printing

Press [SET] while printing. A confirmation dialog appears. Select [OK] and press [SET]. With Canon's PictBridge compatible printers, the printing will stop immediately (even if not completed) and the paper will be fed through.

Printing errors

If an error occurs during the printing process, an error message appears (📖 78).
- Canon's PictBridge compatible printers: Resolve the error. When printing does not resume automatically, select [CONTINUE] and press [SET]. If [CONTINUE] cannot be selected, select [STOP], press [SET] and retry printing. Refer also to the printer's instruction manual for details.
- If the error still persists and printing does not restart, disconnect the USB cable and turn off the camcorder and the printer. After a short while, turn them on again, set the camcorder to [PLAY] mode and restore the connection.

When you have finished printing

Disconnect the cable from the camcorder and printer and turn off the camcorder.

IMPORTANT

● The following still images may not be correctly printed with a PictBridge compatible printer.
- Images created or changed on a computer and transferred to the memory card.
- Images recorded with the camcorder but edited on a computer.
- Images whose file names were changed.
- Images not recorded with this camcorder.

● Observe the following precautions during printing:
- Do not turn off the camcorder or the printer.
- Do not change the position of the / switch.
- Do not disconnect the USB cable.
- Do not remove the memory card.

● If the message "BUSY." does not disappear, disconnect the USB cable and restore the connection after a short while.

Trimming Settings

Set the paper size and page layout before changing the trimming settings.

1 In the print setting menu, select (▲▼) [TRIMMING] and press [SET].

The trimming frame appears.



2 Change the size of the trimming frame.

• Move the zoom lever toward **T** to shrink the frame, and toward **W** to enlarge it.

• To cancel the trimming settings, move the zoom lever toward **W** until the trimming frame disappears.



3 Adjust the trimming frame as desired and then press MENU to return to the print setting menu.

Repeatedly press SET to toggle between the adjustment options and make the adjustment (▲▼) as necessary with the SET dial.

: Change the orientation of the frame (portrait/landscape).

: Move the frame right and left.

: Move the frame up and down.

4 After setting the trimming frame, press MENU to return to the print menu.

NOTES

● About the color of the trimming frame:
- White: No trimming settings.
- Green: Recommended trimming size. (The trimming frame may not appear in green depending on the image size, paper size or borders settings.)

● The trimming setting applies only to one image.

● The trimming setting is canceled in the following cases:
- When you turn off the camcorder.
- When you disconnect the USB cable.
- When you expand the trimming frame beyond its maximum size.
- When you change the [PAPER SIZE] setting.

● You may not be able to set the trimming settings for a still image not recorded with this camcorder.

Print Orders

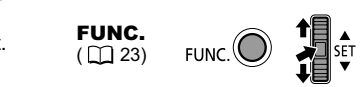
You can mark the still images you want to print and set the desired number of copies as a print order. These print order settings are compatible with the Digital Print Order Format (DPOF) standards and can be used for printing on DPOF compatible printers (📖 68). You can set print orders for up to 998 still images.

Selecting Still Images for Printing (Print Order)

Do not connect the USB cable to the camcorder while setting the print orders.

CAMERA | CAMERA | PLAY | PLAY (📖 10)

FUNC. (📖 23)



FUNC. ⇨ PRINT ORDER

⇩

FUNC. ⇦ Select (▲▼) the number of copies (0 - 99) and press SET.*

* To cancel the print order, set the number of copies to 0.

Setting Print Orders from the Index Screen

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

Move the zoom lever toward **W** to enter the still image index screen.

MENU (📖 22) MENU SET

MENU ⇨ CARD OPERATIONS
⇩
➡PRINT ORDER
⇩
Bring (▲▼) the cursor ☞ to the image you want to print and press SET.
⇩
Set (▲▼) the desired number of copies and press SET.*
MENU ** ⇦ Repeat these steps to set print orders for additional images.

* 🖶 and the number of copies appear on images marked with a print order. To cancel the print order set (▲▼) the number of copies to 0.

**After closing the menu the camcorder returns to the index screen.

Erasing All Print Orders

CAMERA | CAMERA | PLAY | **PLAY** (📖 10)

MENU (📖 22) MENU SET

MENU ⇨ CARD OPERATIONS
⇩
PRINT ORD.ALL ERASE
⇩
MENU ⇦ YES

Printing

🖶 ➡PRINT

MENU (📖 22) MENU SET

1 Connect the camcorder to the printer using the USB connection – connection type 1 (📖 64)– shown in the previous section *PC Connection Diagrams*.

2 Press MENU and select (▲▼) [➡PRINT].
- The print setting menu appears.
- The error message "SET 🖶 PRINT ORDER" appears if you connect a printer with direct print function and select [➡PRINT] without having set any print orders.

3 Make sure that [PRINT] is selected and press SET.
Printing starts. The print setting menu disappears when the printing is completed.

NOTES

- Depending on the connected printer, you can change some print settings before step 3 (📖 69).
- **Cancel Printing/Printing Errors** (📖 70)
- **Restarting Printing:** Press MENU and select [➡PRINT]. Select [RESUME] in the print setting menu and press SET. The remaining images will be printed.

Printing cannot be restarted when the print order settings have been changed or if you deleted a still image with print order settings.

E

Troubleshooting

If you have a problem with your camcorder, refer to this checklist. Consult your dealer or a Canon Service Center if the problem persists.

Power Source

Problem	Solution	🕮
• Camcorder will not turn on. • The camcorder switches off by itself. • The cassette compartment cover will not open. • The cassette compartment stopped half way while inserting/removing a tape. • The LCD/viewfinder switches on and off.	Battery pack is exhausted. Replace or charge the battery pack.	18
	Attach the battery pack correctly.	
	Use the compact power adapter.	
Battery pack will not charge.	Charge the battery pack in temperatures between 0 °C and 40 °C (32 °F and 104 °F).	–
	Battery packs become hot with use and may not charge. The charging will start once the battery pack temperature is below 40 °C (104 °F).	–
	The battery pack is damaged. Use a different battery pack.	–
	Check that the compact power adapter is correctly connected to the camcorder.	

Recording/Playback

Problem	Solution	🕮
Buttons will not work.	Turn on the camcorder.	–
	Load a cassette.	19
Abnormal characters appear on the screen. The camcorder does not operate properly.	Disconnect the power source and reconnect it after a short time. If the problem still persists, disconnect the power source and press the RESET button with a pointed item. Pressing the RESET button resets all settings.	–
"📼" flashes on the screen.	Load a cassette.	19
"🔋" flashes on the screen.	Battery pack is exhausted. Replace or charge the battery pack.	18
"💧" flashes on the screen.	Condensation is detected. See reference page.	82
The lens cover is not completely open.	Turn the camcorder off and then on again.	–
"⚡" flashes red on the screen.	The camcorder malfunctions. Consult a Canon Service Center.	–
"REMOVE THE CASSETTE" appears on the screen.	Remove the cassette and reinsert it.	19
The wireless controller will not work.	Set [WL.REMOTE] to [ON].	37
	The battery of the wireless controller is exhausted. Replace the battery.	21

Problem	Solution	🕮
Video noise appears on screen.	When using the camcorder in a room where a plasma TV is located, keep a distance between the camcorder and the plasma TV.	–
Video noise appears on the TV screen.	When using the camcorder in a room where a TV is located, keep a distance between the compact power adapter and the power or antenna cables of the TV.	–
The tape stops during record pause or playback pause.	To protect the tape and video heads, the camcorder will enter the stop mode (■) if left in playback pause (▶❚❚) or record pause (●❚❚) mode for 4 minutes 30 seconds. To resume the playback press Start/Stop (when recording) or ▶/❚❚ (during playback).	–

Recording

Problem	Solution	🕮
Image will not appear on the screen.	Set the camcorder to CAMERA·📼.	25
"SET THE TIME ZONE, DATE AND TIME" appears on the screen.	Set the time zone, date and time.	24
	Recharge the built-in lithium battery and set the time zone, date and time.	81
Pressing the start/stop button will not start recording.	Set the camcorder to CAMERA·📼.	25
	Load a cassette.	19
	Tape reached the end ("📼 END" appears on the screen). Rewind the tape or replace the cassette.	19
	Cassette is protected ("📼 " flashes on the screen). Change the position of the protect switch.	80
Camcorder will not focus.	Autofocus does not work on that subject. Focus manually.	44
	If you are using the viewfinder, adjust it with the dioptric adjustment lever.	21
	Lens is dirty. Clean the lens with a soft lens-cleaning cloth. Never use tissue paper to clean the lens.	82
	If you are using the optional Wide-converter or Tele-converter, set [AF MODE] to [NORMAL AF].	31
Sound is distorted.	When recording near loud sounds (such as fireworks or concerts), sound may become distorted.	–
Viewfinder picture is blurred.	Adjust the viewfinder with the dioptric adjustment lever.	21

Playback

Problem	Solution	🕮
During playback there is video noise.	Video heads are dirty. Clean the video heads.	82
Pressing the playback button does not start playback.	Load a cassette.	19
	Set the camcorder to PLAY·📼.	27
	Tape reached the end ("📼 END" appears on the screen). Rewind the tape.	19

Problem	Solution	🕮
No sound from the built-in speaker.	Open the LCD panel.	–
	Speaker volume is turned off. Adjust the volume with the SET dial.	27
When playing back a tape recorded in HDV standard the playback is jerky or the sound stutters on and off.	Video heads are dirty. Clean the video heads.	82
Image will not appear on the TV screen.	Set [AV➡ DV] to [OFF].	33
	Check again that the camcorder is properly connected to the TV.	57
	When connecting the camcorder to an HDTV using the CTC-100 Component Cable, make sure to select the correct specification for the [COMP.OUT] setting.	57
There is no sound from the TV.	When connecting the camcorder to an HDTV using the CTC-100 Component Cable, make sure to connect also the audio connections using the white and red plugs of the STV-250N Stereo Video Cable.	57
Text displays do not appear on the TV.	If you connected the camcorder to the TV using the video component connection, set [DV OUTPUT] to [HDV/DV].	35
Tape is running, but image will not appear on the TV screen.	TV/VIDEO selector on the TV is not set to VIDEO. Set the selector to VIDEO.	59
	Video heads are dirty. Clean the video heads.	82
	You attempted to play back or dub copyright a protected tape. Stop playback/dubbing.	62

Memory Card Operation

Problem	Solution	🕮
Memory card cannot be inserted.	Memory card was not facing the correct direction. Turn the memory card over and reinsert it.	20
Cannot record on the memory card.	Memory card is full. Erase still images to free some space or replace the memory card.	55
	Memory card was not initialized. Initialize the memory card.	56
	The folder and file numbers have reached their maximum value. Set [FILE NOS.] to [RESET] and insert a new memory card.	33
Memory card cannot be played back.	Set the camcorder to PLAY·▭.	29
Image cannot be erased.	Image is protected. Cancel the protection.	55
"▭" flashes in red.	Card error occurred. Turn off the camcorder. Remove and reinsert the memory card. Initialize the memory card if flashing persists.	56

Printing

Problem	Solution	🕮
The printer is not operating even though the camcorder and printer are correctly connected.	Disconnect the USB cable and turn off the camcorder and the printer. After a short while, turn them on again, set the camcorder to PLAY mode and restore the connection.	–

Editing

Problem	Solution	🕮
Cannot record with this camcorder video input from an external video device connected to the HDV/TV terminal using a DV cable.	Set [AV ➡ DV] to [OFF].	33
	Wrong signal standard. Dubbing may work using the AV IN/OUT terminal. Refer also to the instruction manual of the connected device.	–

Others

Problem	Solution	🕮
A rattling can be heard from the camcorder.	The internal lens fixture can move when the camcorder is turned off. This is not a malfunction.	–

List of Messages

Message	Explanation/Solution	🕮
SET THE TIME ZONE, DATE AND TIME	You have not set the time zone, date and time. This message appears each time you turn the power on until you set the time zone, date and time.	24
CHANGE THE BATTERY PACK	Battery pack is exhausted. Replace or charge the battery pack.	18
THE TAPE IS SET FOR ERASURE PREVENTION	Cassette is protected. Replace the cassette or change the position of the protect switch.	80
REMOVE THE CASSETTE	Camcorder stopped operating to protect the tape. Remove the cassette and reinsert it.	19
CHECK THE HDV/DV INPUT (Appears only if a DV cable is connected)	The DV cable is not correctly connected to the HDV/DV terminal, or the connected digital device is turned off.	57
	The video input signal is in a different television system (PAL or SECAM).	–
CONDENSATION HAS BEEN DETECTED	Condensation has been detected in the camcorder.	82
CONDENSATION HAS BEEN DETECTED REMOVE THE CASSETTE	Condensation has been detected in the camcorder. Remove the cassette.	82
TAPE END	Tape reached the end. Rewind the tape or replace the cassette.	–

Message	Explanation/Solution	🕮
INCORRECT TAPE SPECIFICATION	You attempted to play back a tape recorded in a different television system (PAL or SECAM) or in a recording standard not supported by this camcorder.	–
INPUT SIGNAL NOT SUPPORTED	The digital device connected with the DV cable is incompatible with the camcorder.	–
PLAYBACK STD LOCKED INCOMPATIBLE VIDEO INPUT	Current camcorder settings do not match the HDV/DV standard of the video input signal. Change the [PLAYBACK STD] setting to match the video input signal.	34
PLAYBACK STD LOCKED PLAYBACK IS RESTRICTED	Current camcorder settings do not match the HDV/DV standard of the recording you tried to play back. Change the [PLAYBACK STD] to match the recording standard of the tape.	34
HEADS DIRTY, USE CLEANING CASSETTE	Video heads are dirty. Clean the video heads.	82
COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED	You attempted to play back a copyright protected tape.	62
COPYRIGHT PROTECTED DUBBING RESTRICTED	You attempted to dub a copyright protected tape. May also appear when an anomalous signal is received during analog line-in recording.	62
NO CARD	Memory card not is inserted into the camcorder.	20
NO IMAGES	No images are recorded on the memory card.	–
CARD ERROR	A memory card error occurred. The camcorder cannot record or display the image. The error may be temporary. If the message disappears after 4 seconds and "🖫" flashes red, turn the camcorder off, remove the card and reinsert the card. If "🖫" changes to green, you can continue recording/playback.	–
CARD FULL	Memory card is full. Erase some images to free some space or replace the memory card.	55
IN CARD POSITION	You pressed Start/Stop while recording still images (CAMERA-🖫 mode).	–
NAMING ERROR	The folder and file numbers have reached their maximum value. Set the [FILE NOS.] option to [RESET] and erase all the images on the memory card or initialize it.	55 56
UNIDENTIFIABLE IMAGE	The image file is corrupted or it was saved using a compression method other than that compatible with this camcorder (JPEG).	–
TRANSFER ORDER ERROR	You attempted to set more than 998 transfer orders.	67
PRINT ORDER ERROR	You attempted to set more than 998 still images in the print order.	71
CANNOT TRANSFER!	You attempted to transfer a still image that cannot be displayed with this camcorder.	–
TOO MANY STILL IMAGES DISCONNECT USB CABLE	Disconnect the USB cable and decrease the number of still images on the memory card to less than 1800. If a dialog appeared on the computer screen, close it and then restore the connection.	–

Direct Print Related Messages

NOTES

About Canon PIXMA/SELPHY DS Printers: If the printer's error indicator flashes or an error message appears on the printer's operation panel, refer to the printer's instruction manual.

Message	Explanation/Solution
PAPER ERROR	There is a problem with the paper. The paper is not correctly loaded or the paper size is wrong. Alternatively, if the paper output tray is closed, open it to print.
NO PAPER	Paper is not correctly inserted or there is no paper.
PAPER JAM	The paper jammed during printing. Select [STOP] to cancel printing. After removing the paper, set some paper again and retry printing.
INK ERROR	There is a problem with the ink.
NO INK	The ink cartridge is not inserted or is out of ink.
LOW INK LEVEL	The ink cartridge needs to be replaced soon. Select [CONTINUE] to restart printing.
INK ABSORBER FULL	Select [CONTINUE] to resume printing. Contact a Canon Service Center (refer to the list included with the printer) to replace the ink absorber.
• FILE ERROR • CANNOT PRINT!	You attempted to print an image that was recorded with another camcorder, with a different compression, or was edited on a computer.
SET PRINT ORDER	No still image on the memory card has been marked with a print order.
READJUST TRIMMING	You changed the print style after you set the trimming settings.
PRINTER ERROR	Cancel printing. Turn the printer off and then on again. Check the printer status. If the error still persists, refer to the printer's instruction manual and contact the appropriate customer support center or service center.
HARDWARE ERROR	Cancel printing. Turn off the printer and turn it back on. Check the printer status. If the printer is equipped with a battery, it might be exhausted. In such case, turn off the printer, replace the battery and turn it back on.
COMMUNICATION ERROR	The printer is experiencing a data transfer error. Cancel printing. Disconnect the USB cable and turn off the camcorder and the printer. After a short while, turn them on again, set the camcorder to PLAY mode and restore the connection. When you are printing using the button, check the print settings. Or, you attempted to print from a memory card that contains a large number of images. Reduce the number of images.
CHECK PRINT SETTINGS	The print setting cannot be used for printing with the button.
PRINTER IN USE	The printer is in use. Check the printer status.
PAPER LEVER ERROR	Paper lever error occurred. Adjust the paper selection lever to the proper position.
PRINTER COVER OPEN	Close the printer cover securely.
NO PRINTHEAD	No print head is installed in the printer or the print head is defective.

Handling Precautions

Camcorder

● Do not carry the camcorder by the LCD panel. Be careful when closing the LCD panel.
● Do not leave the camcorder in places subject to high temperatures (like the inside of a car under direct sunlight), or high humidity.
● Do not use the camcorder near strong electric or magnetic fields such as above TVs, near plasma TVs or mobile phones.
● Do not point the lens or viewfinder at strong light sources. Do not leave the camcorder pointed at a bright subject.
● Do not use or store the camcorder in dusty or sandy places. The camcorder is not waterproof – avoid also water, mud or salt. If any of the above should get into the camcorder it may damage the camcorder and/or the lens.
● Be careful of heat generated by lighting equipment.
● Do not disassemble the camcorder. If the camcorder does not function properly, consult qualified service personnel.
● Handle the camcorder with care. Do not subject the camcorder to shocks or vibration as this may cause damage.

Battery Pack

DANGER!
Treat the battery pack with care.
• Keep it away from fire (or it might explode).
• Do not expose the battery pack to temperature higher than 60 °C (140 °F). Do not leave it near a heater or inside a car in hot weather.
• Do not try to disassemble or modify it.
• Do not drop or knock it.
• Do not get it wet.

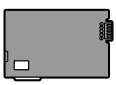
● Charged battery packs continue to discharge naturally. Therefore, charge them on the day of use, or the day before, to ensure a full charge.
● Attach the terminal cover whenever a battery pack is not in use. Contact with metallic objects may cause a short circuit and damage the battery pack.
● Dirty terminals may cause a poor contact between the battery pack and the camcorder. Wipe the terminals with a soft cloth.
● Since storing a charged battery pack for a long time (about 1 year) can shorten its lifecycle or affect performance, we recommend to discharge the battery pack fully and to store it in a dry place at temperatures no higher than 30 °C (86 °F). If you do not use the battery pack for long periods, charge and discharge it fully at least once a year. If you have more than one battery pack, perform these precautions at the same time for all battery packs.
● Although the battery pack's operating temperature range is from 0 °C to 40 °C (32 °F to 104 °F), the optimal range is from 10 °C to 30 °C (50 °F to 86 °F). At cold temperatures, performance will temporarily decline. Warm it in your pocket before use.

● Replace the battery pack if the usable time after full charge diminishes substantially at normal temperatures.

About the battery terminal cover

The battery terminal cover has a [▭]-shaped hole. This is useful when you wish to differentiate between charged and uncharged battery packs.

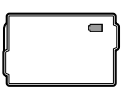
Back side of the battery pack



Terminal cover attached
Charged



Uncharged

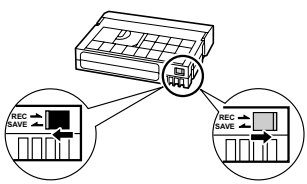


Cassette

● Rewind tapes after use. A slack or damaged tape may cause video problems and/or audio distortions during playback.
● Return cassettes to the case and store them upright. Rewind tapes from time to time if they are stored for a long time.
● Do not leave the cassette in the camcorder after use.
● Do not use spliced tapes or nonstandard cassettes as they may damage the camcorder.
● Do not use tapes that have been jammed as video heads may become dirty.
● Do not insert anything into the small holes of the cassette, or cover them with cellophane tape.
● Handle cassettes with care. Do not drop or subject them to severe impact as this may damage the cassettes.
● With cassettes equipped with a memory function, metal plated terminals may become dirty with use. Clean the terminals with a cotton swab after about 10 times of removing and reinserting the cassette. The memory function is not supported by the camcorder.

Protecting Tapes from Accidental Erasure

To protect your recordings from accidental erasure, slide the tab on the cassette to SAVE or ERASE OFF.



Memory Card

● We recommend saving backups of memory card images on your computer. Image data may be corrupted or lost due to memory card defects or exposure to static electricity. Canon Inc. makes no warranties for corrupted or lost data.
● Do not turn off the camcorder, disconnect the power source or remove the memory card while the CARD access indicator is flashing.
● Do not use memory cards in places subject to strong magnetic fields.
● Do not leave memory cards in places subject to high humidity and high temperature.
● Do not disassemble, bend, drop, or subject memory cards to shocks and do not expose them to water.
● Do not touch or expose the terminals to dust or dirt.
● Check the direction before inserting the memory card. Forcing a memory card into

the slot if it is not correctly oriented may damage the memory card or the camcorder.
● Do not attach any labels or stickers on the memory card.
● When you erase image files or initialize the memory card, only the file allocation table is altered and the data itself is not actually deleted. Take the necessary precautions when you dispose of the memory card, for example by physically damaging it to prevent the leakage of private data.

Lithium Button Battery

WARNING!
- The battery used in this device may present a fire or chemical burn hazard if mishandled. Do not recharge, disassemble, heat above 100 °C (212 °F) or incinerate the battery.
- Replace the battery with a CR2025 made by Panasonic, Hitachi Maxell, Sony, Sanyo, or with Duracell2025. Use of other batteries may present a risk of fire or explosion.
- Dispose of the used battery according to applicable recycling regulations.

● Do not pick up the battery using tweezers or other metal tools as this will cause a short circuit.
● Wipe the battery with a clean dry cloth to ensure proper contact.
● Keep the battery out of the reach of children. If swallowed, seek medical assistance immediately. The battery case may break and the battery fluids may cause internal damage.
● Do not disassemble, heat or immerse the battery in water to avoid the risk of explosion.

Built-in Rechargeable Lithium Battery

The camcorder has a built-in rechargeable lithium battery to keep the date/time and other settings. The built-in lithium battery is recharged while you use the camcorder, however, it will become totally discharged if you do not use the camcorder for about 3 months.
To recharge the built-in lithium battery:
Connect the compact power adapter to the camcorder and leave it connected for 24 hours with the power switch set to OFF.

Maintenance/Others

Cleaning the Video Heads

● In the following cases the video heads are dirty and need to be cleaned.
- The message "HEADS DIRTY, USE CLEANING CASSETTE" appears.
- During playback you notice frequent video problems (blocky video artifacts, banding, etc.).
- When playing back a tape recorded in HDV standard the playback is jerky or the sound stutters on and off.

To maintain the best picture quality, we recommend using cassettes designed for high definition recording (Canon Digital Videocassette HDVM-E63PR, etc.) and cleaning the video heads frequently with the Canon DVM-CL Digital Video Head Cleaning Cassette or a commercially available dry cleaning cassette.

● Do not use wet type cleaning cassettes as this may damage the camcorder.
● Even after cleaning the video heads you may not be able to play back correctly tapes that were recorded with dirty video heads.

Cleaning the Camcorder

Camcorder Body

● Use a soft, dry cloth to clean the camcorder body. Never use chemically treated cloth or volatile solvents such as paint thinner.

Lens and Viewfinder

● If the lens surface is dirty, the autofocus may not work properly.
● Remove any dust or dirt particles using a non-aerosol type blower brush.
● Use a clean, soft lens-cleaning cloth to gently wipe the lens or viewfinder. Never use tissue paper.

LCD Screen and I.AF sensor

● Clean the LCD screen and the I.AF sensor using a clean, soft lens-cleaning cloth.
● Condensation may form on the surface of the screen when the temperature changes suddenly. Wipe it with a soft dry cloth.

Storage

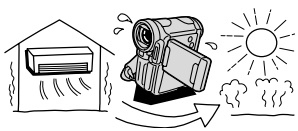
● If you do not intend to use the camcorder for a long time, store it in a place free of dust, in low humidity, and at temperatures not higher than 30 °C (86 °F).

Condensation

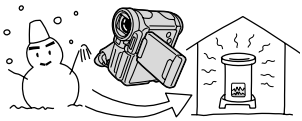
Moving the camcorder rapidly between hot and cold temperatures may cause condensation (water droplets) to form on its internal surfaces. Stop using the camcorder if condensation is detected. Continued use may damage the camcorder.

Condensation may form in the following cases:

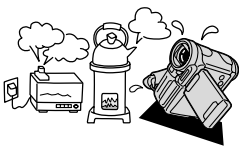
When the camcorder is moved from an air-conditioned room to a warm, humid place



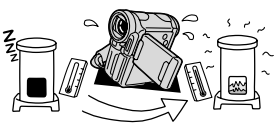
When the camcorder is moved from a cold place to a warm room



When the camcorder is left in a humid room



When a cold room is heated rapidly



To avoid condensation

- Do not expose the camcorder to sudden or extreme changes in temperature.
- Remove the cassette, place the camcorder in an airtight plastic bag and let it adjust to temperature changes slowly before removing it from the bag.

When condensation is detected

- The camcorder automatically shuts off, the warning message "CONDENSATION HAS BEEN DETECTED" appears for approx. 4 seconds and starts flashing.
- If a cassette is loaded, the warning message "REMOVE THE CASSETTE" appears and starts flashing. Remove the cassette immediately and leave the cassette compartment open. Leaving the cassette in the camcorder may damage the tape.
- A cassette cannot be loaded when condensation is detected.

Resuming use

- The precise time required for water droplets to evaporate will vary depending on the location and weather conditions. After the condensation warning stops flashing, wait for 1 more hour before resuming use.

Using the Camcorder Abroad

Power Sources

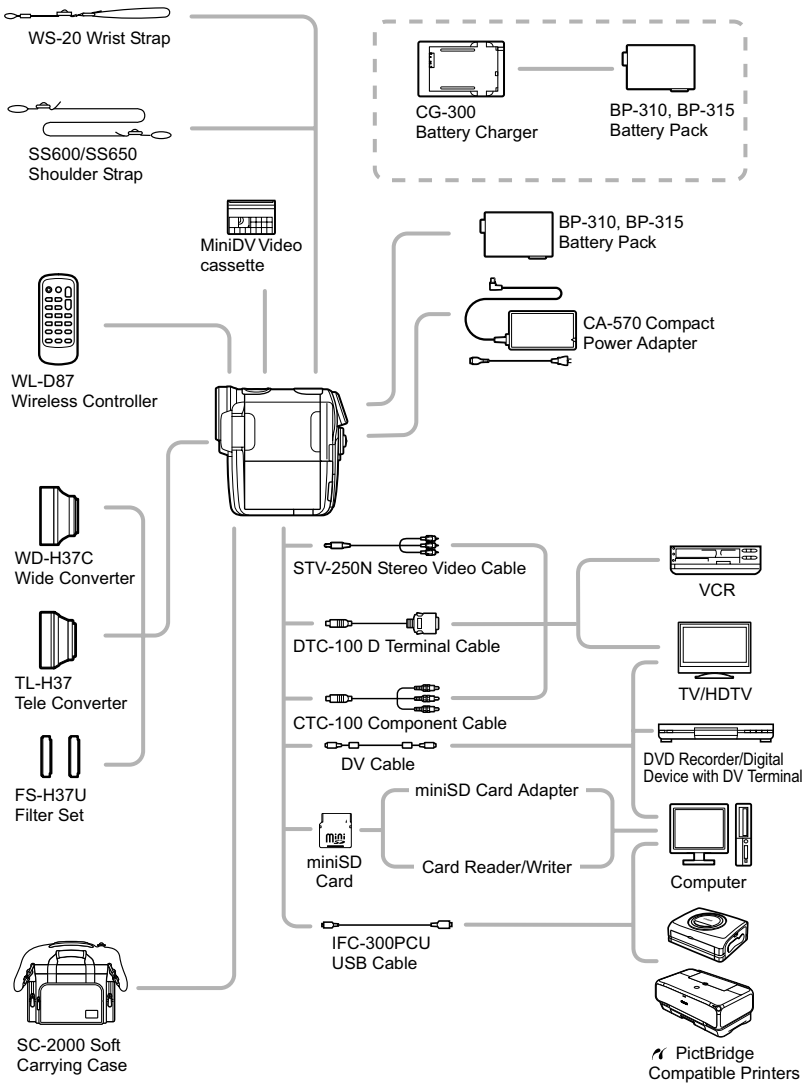
You can use the compact power adapter to operate the camcorder and to charge battery packs in any country with power supply between 100 and 240 V AC, 50/60 Hz. Consult the Canon Service Center for information on plug adapters for overseas use.

Playback on a TV Screen

You can only play back your recordings on TVs compatible with the NTSC system. The NTSC system is used in the following countries/areas:

American Samoa, Antigua, Aruba, Bahamas, Barbados, Bermuda, Bolivia, Canada, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guam, Guatemala, Greenland, Haiti, Honduras, Jamaica, Japan, Korea, Mexico, Micronesia, Myanmar, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Surinam, Taiwan, Trinidad and Tobago, USA, Venezuela, Virgin Islands.

System Diagram (Availability differs from area to area)



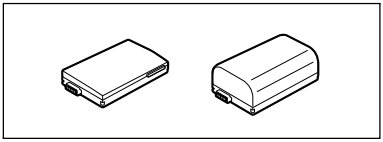
Optional Accessories

Call or visit your local retailer/dealer for genuine Canon video accessories. You can also obtain genuine accessories for your Canon camcorder by calling: 1-800-828-4040, Canon U.S.A. Information Center.

Use of genuine Canon accessories is recommended.
This product is designed to achieve excellent performance when used with genuine Canon accessories. Canon shall not be liable for any damage to this product and/or accidents such as fire, etc., caused by the malfunction of non-genuine Canon accessories (e.g., a leakage and/or explosion of a battery pack). Please note that this warranty does not apply to repairs arising out of the malfunction of non-genuine Canon accessories, although you may request such repairs on a chargeable basis.

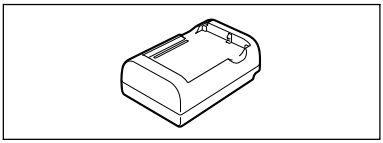
Battery Packs

When you need extra battery packs, select the BP-310 or BP-315 battery pack.



CG-300 Battery Charger

Use the battery charger for charging the battery packs. It plugs directly into a power outlet without a cable.

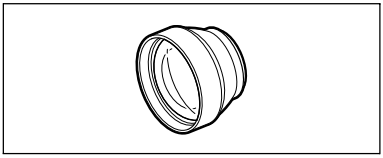


Battery Pack	Charging Time*
BP-310	105 min.
BP-315	160 min.

* Charging time varies according to the charging condition.

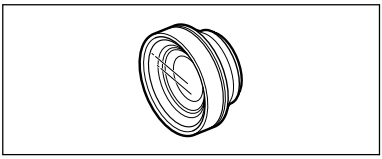
TL-H37 Tele-converter

This Tele-converter lens increases the focal length of the camcorder lens by a factor of 1.5.

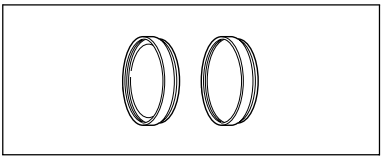


- The image stabilizer is not as effective when the Tele-converter is attached.
- The minimum focusing distance with the TL-H37 is 2.3 m (7.5 ft.); 2.3 cm (0.91 in.) at maximum wide angle.
- When the Tele-converter is attached, a shadow may appear in the picture when you record with flash or assist lamp.

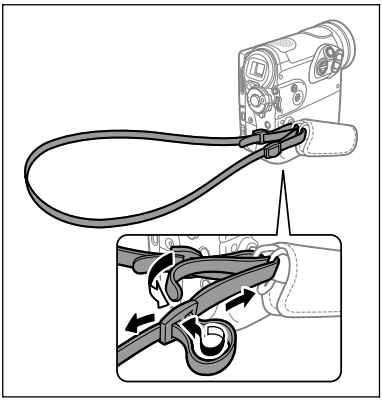
WD-H37C Wide-converter
This lens decreases focal length by a factor of 0.7, giving you a wide perspective for indoor shots or panoramic views.
- When the Wide-converter is attached, a shadow may appear in the picture when you record with flash or assist lamp.



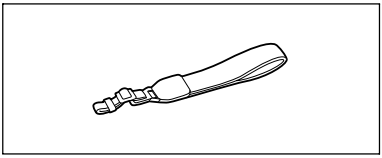
FS-H37U Filter Set
Neutral density and MC protector filters help you to control difficult lighting conditions.



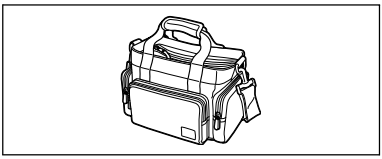
Shoulder Strap
You can attach a shoulder strap for more security and portability.
Pass the ends through the strap mount and adjust the length of the strap.



WS-20 Wrist Strap
Use this for extra additional protection for active shooting.



SC-2000 Soft Carrying Case
A handy camcorder bag with padded compartments and plenty of space for accessories.



This mark identifies genuine Canon video accessories. When you use Canon video equipment, we recommend Canon-brand accessories or products bearing the same mark.

Product Codes

Provided Accessories

CA-570 Compact Power Adapter	8468A002AA
BP-310 Battery Pack	D85-1662-000
WL-D87 Wireless Controller	D83-0752-000
STV-250N Stereo Video Cable	3067A002AA (D82-0590-201)
CTC-100 Component Cable	D82-0840-000

Optional Accessories

BP-315 Battery Pack	0782B002AA
CG-300 Battery Charger	0784B002AA
TL-H37 Tele-converter	8835A001AA
WD-H37C Wide-converter	1305B001AA
FS-H37U Filter Set	8837A001AA
WS-20 Wrist Strap	3118A002AA (D81-0190-202)
SC-2000 Soft Carrying Case	9389A001AA

Specifications

HV10

System

Video Recording System	2 rotary heads, helical scanning HDV HDV 1080i DV DV system (consumer digital VCR SD system), digital component recording
Audio Recording System	HDV MPEG-1 Audio Layer 2, 16 bit, 48 kHz; transfer rate 384 kbps (2 channels) DV PCM digital sound: 16 bit (48 kHz/2 channels); 12 bit (32 kHz/4 channels)
Television System	HD High Definition Video (HDV) 1080/60i SD EIA standard (525 lines, 60 fields) NTSC color signal
Image Sensor	1/2.7-inch CMOS, approx. 2,960,000 pixels Effective pixels: Movies HDV/DV (WIDE): approx. 2,070,000 DV (NORMAL): approx. 1,550,000 Still images 16:9 still images: approx. 2,070,000 4:3 still images: approx. 2,760,000
Compatible Tapes	Videocassettes bearing the mini DV mark.
Tape Speed	HDV 18.81 mm/s (0.74 ips) DV SP: 18.81 mm/s (0.74 ips); LP: 12.56 mm/s (0.49 ips)
Maximum Recording Time (60 min. tape)	HDV 60 minutes DV SP: 60 minutes; LP: 90 minutes
LCD Screen	2.7 in., wide, TFT color, approx. 210,000 pixels
Viewfinder	0.27 in., wide, TFT color, approx. 123,000 pixels
Microphone	Stereo electret condenser microphone
Lens	f=6.1-61 mm, F/1.8-3.0, 10x power zoom 35 mm equivalent: Movies HDV/DV (WIDE): 43.6-436 mm DV (NORMAL): 53.0-530 mm Still images 16:9 still images: 43.6-436 mm 4:3 still images: 40.0-400 mm
Lens Configuration	11 elements in 9 groups
Filter Diameter	37 mm
AF system	Autofocus (TTL + external distance sensor when set to [INSTANT AF]), manual focus available
Minimum Focusing Distance	1 m (3.3 ft.); 1 cm (0.39 in.) on maximum wide angle
White Balance	Auto white balance, preset white balance (DAYLIGHT, SHADE, CLOUDY, TUNGSTEN, FLUORESCENT, FLUORESCENT H) or custom white balance
Minimum Illumination	0.3 lx ([NIGHT] recording program (SCN), Shutter speed at 1/2) 5 lx (Auto mode, Auto slow shutter [ON], Shutter speed at 1/30)
Recommended Illumination	More than 100 lx
Image Stabilization	Optical

Memory Card

Recording Media	miniSD Card*
Size of Still Images	2048 x 1536, 1920 x 1080, 1440 x 1080, 848 x 480, 640 x 480 pixels
File Format	Design rule for Camera File system (DCF), Exif 2.2** compliant, DPOF compliant
Image Compression Method	JPEG (compression: Super Fine, Fine, Normal)

* This camcorder has been tested with miniSD cards up to 1 GB. Performance cannot be guaranteed for all miniSD cards.

** This camcorder supports Exif 2.2 (also called "Exif Print"). Exif Print is a standard for enhancing the communication between camcorders and printers. By connecting to an Exif Print-compliant printer, the camcorder's image data at the time of shooting is used and optimized, yielding extremely high quality prints.

Input/Output Terminals

AV IN/OUT Terminal	∅3.5 mm minijack Video: 1 Vp-p/75 ohms unbalanced Audio: output: -10dBV (47 kohms load/3 kohms or less) input: -10dBV/40 kohms or more
USB Terminal	mini-B
HDV/DV Terminal	4 pin (IEEE1394 standard), input/output
COMP.OUT Terminal	Luminance (Y): 1 Vp-p/75 ohms Chrominance (P_B/P_R (C_B/C_R)): ±350 mVp-p 1080i (D3) / 480i (D1) compatible

Power/Others

Power supply (rated)	7.4 V DC (battery pack), 8.4 V DC (compact power adapter)
Power consumption (HDV, AF on)	4.8 W (viewfinder), 5.0 W (LCD screen, normal brightness)
Operating temperature	0 – 40 °C (32 – 104 °F)
Dimensions (W x H x D)	56 x 104 x 106 mm (2.2 x 4.1 x 4.2 in.) excluding the grip belt
Weight (camcorder body only)	440 g (15.5 oz.)

CA-570 Compact Power Adapter

Power supply	100 – 240 V AC, 50/60 Hz
Power consumption	17 W
Rated output	8.4 V DC, 1.5 A
Operating temperature	0 – 40 °C (32 – 104 °F)
Dimensions	52 x 90 x 29 mm (2.1 x 3.5 x 1.1 in.)
Weight	135 g (4.8 oz.)

BP-310 Battery Pack

Battery type	Rechargeable Lithium Ion Battery
Rated voltage	7.4 V DC
Operating temperature	0 – 40 °C (32 – 104 °F)
Battery capacity	850 mAh
Dimensions	39 x 8 x 63 mm (1.5 x 0.31 x 2.5 in.)
Weight	40 g (1.4 oz.)

Weight and dimensions are approximate. Errors and omissions excepted. Subject to change without notice.

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U.S.A.

CANON CONSUMER DIGITAL VIDEO EQUIPMENT LIMITED WARRANTY FOR THE UNITED STATES

The warranty set forward below is given by Canon U.S.A., Inc. with respect to equipment purchased in the United States. The limited warranty is only effective upon presentation of your Bill of Sale or other proof of purchase. Canon consumer digital video equipment is warranted under normal, non-commercial, personal use, against defective materials or workmanship as follows:
Parts: Defective parts will be exchanged for new parts or comparable rebuilt parts for a period of ONE YEAR from the date of original purchase, except for a defective Video Head, which will be exchanged for a period of three months from the date of purchase.
Labor: For a period of ONE YEAR from the date of original purchase, labor will be provided free of charge by our factory service centers or designated service facilities located in the United States.
When returning equipment under this warranty, you must pre-pay the shipping charges, and you must enclose the Bill of Sale or other proof of purchase with a complete explanation of the problem. During your ONE-YEAR warranty period, repairs will be made and the equipment return-shipped to you free of charge. After your warranty period is over, you will be given an estimate of the cost of repair and an opportunity to approve or disapprove of the repair expense before it is incurred. If you approve, repairs will be made and the equipment return-shipped to you. (shipping charges apply). If you disapprove, we will return-ship the equipment at no charge to you.

Non-Canon brand peripheral equipment and software which may be distributed with Canon DV camcorders are sold "AS IS" without warranty of any kind by CUSA, including any implied warranty regarding merchantability or fitness for a particular purpose. The sole warranty with respect to such non-Canon brand items is given by the manufacturer or producer thereof.
CUSA shall have no responsibility under this limited warranty for use of Canon DV Camcorders in conjunction with incompatible peripheral equipment and incompatible software.

In order to obtain warranty service, contact the authorized Canon retail dealer from whom you purchased the DV Camcorder or call the CANON INFORMATION CENTER AT 1-800-828-4040). You will be directed to the nearest service facility for your product.

This Limited Warranty covers all defects encountered in normal use of the equipment and does not apply in the following cases:

A) Loss or damage to the equipment due to abuse, mishandling, accident, improper maintenance, or failure to follow operating instructions;
B) If the equipment is defective as a result of leaking batteries, sand, dirt or water damage;
C) If defects or damages are caused by the use of unauthorized parts or by service other than our authorized agent;
D) If the equipment is used for commercial or industrial use.

This Limited Warranty does not cover cabinet (exterior finish), video cassette tape, head cleanings, nor does it apply to equipment purchased outside the United States. This warranty does not cover units sold to rental firms, military operations, hotels, schools, hospitals or for other commercial, industrial, or institutional applications. These uses are covered only by such specific warranty as Canon may issue with such sales.
This Limited Warranty does not apply to accessories or consumables for the DV Camcorder, which are sold "AS IS", without warranty of any kind by CUSA.
Please retain this warranty card and your Bill of Sale as a permanent record of your purchase. This card is most important in order to be sure you are contacted right away should there be a safety inspection, modification or product recall under applicable laws or regulations.

NO IMPLIED WARRANTY, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE APPLIES TO THIS EQUIPMENT AFTER THE APPLICABLE PERIOD OF EXPRESS WARRANTY OR GUARANTY, EXCEPT AS MENTIONED ABOVE, GIVEN BY ANY PERSON, FIRM OR CORPORATION WITH RESPECT TO THIS EQUIPMENT SHALL BIND THE UNDERSIGNED. (SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU). CUSA SHALL NOT BE LIABLE FOR LOSS OF REVENUES OR PROFITS, EXPENSE FOR SUBSTITUTE EQUIPMENT OR SERVICE, STORAGE CHARGES, LOSS OF DATA, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY THE USE, MISUSE OR INABILITY TO USE THE DV CAMCORDER, REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF CUSA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOR SHALL RECOVERY OF ANY KIND AGAINST CUSA BE GREATER THAN THE PURCHASE PRICE OF THE DV CAMCORDER SOLD BY CUSA AND CAUSING THE ALLEGED DAMAGE. WITHOUT LIMITING THE FOREGOING, YOU ASSUME ALL RISK AND LIABILITY FOR LOSS, DAMAGE OR INJURY TO YOU AND YOUR PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF USE, MISUSE OR INABILITY TO USE THE DV CAMCORDER NOT CAUSED DIRECTLY BY THE NEGLIGENCE OF CUSA. (SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU).THIS WARRANTY SHALL NOT EXTEND TO ANYONE OTHER THAN THE ORIGINAL PURCHASER OF THIS EQUIPMENT OR THE PERSON FOR WHOM IT WAS PURCHASED AS A GIFT.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.
CANON U.S.A., INC.

CANADA

CANON CONSUMER DIGITAL VIDEO EQUIPMENT LIMITED WARRANTY

The limited warranty set forth below is given by Canon Canada Inc. (“Canon Canada”) with respect to Canon digital video equipment purchased in Canada. This limited warranty is only effective upon presentation of a bill of sale or other proof of purchase for this Canon digital video equipment to a Canon Service Facility when repairs are required.
Canon consumer video digital equipment is warranted under normal, non-commercial, personal use, against defective materials or workmanship as follows:
Parts: Defective parts will be exchanged for new parts or, at Canon Canada’s option, comparable rebuilt parts for a period of one year from the date of original purchase, except Video Heads which will be exchanged for a period of 3 months from the date of purchase.
Labour: For a period of one year from the date of original purchase, labour will be provided free of charge by our Canon Service Facilities in Canada.
This limited warranty covers all defects except where:
(a) The loss or damage to the product results from:

i) accident, natural disaster, mishandling, abuse, neglect, unauthorized product modification or failure to follow instructions contained in the instruction manual;
ii) the use of accessories, attachments, products, supplies, parts or devices with this Canon product that do not conform to Canon specifications or that cause abnormally frequent service problems;
iii) repairs or services performed by any party other than a Canon Service Facility;
iv) defective batteries or any exposure to water, sand or dirt;
v) shipping (claim must be presented to the shipper);

(b) Any serial number on the video equipment is altered or removed.
(c) The digital video equipment is used for commercial, professional or industrial purposes.
This limited warranty does not cover the cabinet (exterior finish) of the digital video equipment, video cassette tapes, head cleanings, nor does it apply to digital video equipment purchased outside Canada.

TO OBTAIN WARRANTY SERVICE

Ship your Canon digital video equipment in its original carton, box or equivalent, properly packed, fully insured with shipping charges prepaid, together with a copy of your bill of sale or other proof of purchase and a description of the problem to any of the Canon Service Facilities in Canada.

LIMITATIONS

Except as otherwise required by applicable legislation, this warranty is in lieu of all other warranties, conditions, guarantees or representations, express or implied, statutory or otherwise, relative to this Canon product, including implied warranties or conditions of merchantability or fitness for a particular purpose.
Canon Canada assumes no liability for special, consequential or incidental damages or loss that may arise, whether on account of negligence or otherwise, from the use, misuse or inability to use this Canon product (including loss of profit, revenue, video tapes or enjoyment) or from failure to conform to any express or implied warranties, conditions, guarantees or representations. Any recovery under this limited warranty shall not exceed the purchase price of the product. Canon Canada does not assume or authorize any other person to assume for Canon Canada any other liability with respect to this Canon product.
This warranty does not extend to any person other than the original purchaser of this Canon product or the person for whom it was purchased as a gift and states your exclusive remedy.

NOTICE TO CONSUMER

If you plan to take important videos or if the product has not been used for some time, please check all functions with the instruction book before using it.

Canon

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- **If you have any questions, call the Canon U.S.A. Information Center toll-free at 1-800-828-4040 (U.S.A. only).**

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